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ABSTRACT

This manual provides guidelines for those who are responsible for disaster planning for libraries and archives. Limited to fire-and-water-related disasters involving books, manuscripts, and photographs, the manual is primarily concerned with planning. Divided into two major areas, disaster preparedness and disaster recovery, the manual covers writing a disaster plan, the contents of a disaster plan, the prevention of disasters, the protection of collections against disaster, response to disaster, and recovery after disaster strikes. The guidelines take into consideration the needs of institutions and collections of different sizes and complexities. The text is supplemented by photographs and an index. Three appendixes provide sample forms and checklists, a list of experts and institutions that can be consulted, and a list of businesses that offer disaster preparedness and recovery services. Bibliographic notes/references are included, as well as a bibliography of over 500 items (primarily in English) on the literature of disasters, disaster preparedness, and disaster recovery. (EW)

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Disaster planning, preparedness and recovery for libraries and archives: a RAMP study with guidelines

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DISASTER PLANNING:

PREPAREDNESS AND RECOVERY FOR LIBRARIES AND ARCHIVES

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PREFACE

In order to assist in meeting the needs of Member States, particularly developing countries, in the specialized areas of Archives Administration and Records Management, the Division of the General Information Programme has developed a long-term Records and Archives Management Programme - RAMP.

The basic elements of RAMP reflect and contribute to the overall themes of the General Information Programme. RAMP thus includes projects, studies and other activities intented to :

- develop standards, rules, methods and other normative tools for the processing and transfer of specialized information and the creation of compatible information systems ;
- enable developing countries to set up their own data bases and to have access to those now in existence throughout the world, so as to increase the exchange and flow of information through the application of modern technologies ;
- promote the development of specialized regional information networks ;
- contribute to the harmonious development of compatible international information services and systems ;
- set up national information systems and improve the various components of these systems ;
- formulate development policies and plans in this field ;
- train information specialists and users and develop the national and regional potential for education and training in the information sciences, library science and archives administration.

...

This important study is composed of two parts : the first part on disaster preparedness covers the different phases of the planning aspects of prevention and protection ; the second part on disaster recovery provides, among other topics, examples of disaster recovery after damage caused by water, fire, etc.

Highlighted by illustrations, it also includes, in the appendices, disaster planning documentation, sample surveys of internal and external hazards and guidelines for judging results and analyzing needs.

Finally, a substantial bibliography on disaster, disaster preparedness, and disaster recovery is also included.

Comments and suggestions regarding the study are welcomed and should be addressed to the Division of the General Information Programme, UNESCO, 7, Place de Fontenoy, 75700 Paris, France. Other studies prepared as part of the RAMP programme may also be obtained at the same address.

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I want to acknowledge all my colleagues who understand that the preservation of library and archival collections is a significant challenge, and consequently have shared their disaster experiences generously. In particular I am grateful to the conservators and directors who have allowed me to list their names and institutions as sources for advice and assistance in times of disaster, and to the photographers who gave permission for use of their photographs.

Barclay and Linda Ogden, Anton Rajer, and John Townsend in particular offered their ideas and recommendations about disaster recovery in countries in which I have had no experience, adding greatly to my understanding. But my greatest debt is to Peter Waters who encouraged me to get my feet wet in the first place, then shared all his experience willingly, insisting I continue vigorously to pursue solutions to the hardest problems.

Special thanks are due as well to Toby Murray for her fine bibliography, Tom Conroy for dedicated additional bibliographic searching, and to Sandra Nyberg, Jane Differding, and Sue Murphy who read and commented upon drafts of the text. Merrily Smith, who convinced me to undertake this manual, also deserves credit for editing. Andrew Buchanan and W. Marion Thompson spent time in the darkroom printing disaster photographs taken under less than ideal conditions.

The final and deepest thanks are to Bruce Buchanan who patiently read all the drafts, asked the hardest questions, and gave the greatest encouragement.

DISASTER PLANNING:

PREPAREDNESS AND RECOVERY FOR LIBRARIES AND ARCHIVES

INTRODUCTION

Libraries and archives are the repositories for the records of a culture's existence. These records reflect the scholarly and creative efforts of a civilization as well as its social and historical interaction. They are a gift from the past to the future, collected in the hope that what we have thought, created, and discovered will be a source of pleasure and assistance for generations to come. The preservation of these fragile and sometimes tenuous links are the responsibility of those to whom their care has been given. One of the greatest tragedies which can befall a library or an archive is disaster. We view with regret and wistfulness the known and unknown treasures lost in the fires at Alexandria and Constantinople, in the pillaging of the monasteries, the ransacking of private and public collections, the devastation by modern war, and the ravages of climate and weather.

A decision to undertake disaster planning is one of the most important a librarian or archivist can make to protect collections. Disasters occur much too frequently in libraries and archives resulting in extensive and costly damage which often could have been prevented or reduced. The instances of damage to collections, buildings, and equipment over the past twenty five years are serious enough to convince even the most sceptical to initiate disaster planning as a top priority for sensible collection management. A partial list of recent catastrophes makes it clear that the prevention of disaster is vital. If it cannot be avoided, then the impact must be reduced by preparedness and informed recovery so that as much as possible is salvaged and restored.

> 1966 - The November 4 flood in Florence, Italy resulted in severe damage to over two million rare and irreplaceable volumes and innumerable manuscripts.

> 1966 - The Jewish Theological Seminary Library, New York, suffered a $3,000,000 loss of burned and water-damaged books in an arson fire.

> 1971 - A fire related to old wiring at Radcliffe Infirmary, Oxford, England totally destroyed one of the world's finest medical libraries of rare materials.

> 1972 - The result of a hurricane which struck the State of Pennsylvania was $6,500,000 in water and flood damage to libraries and archives in the state.

> 1975 - Case-Western Reserve University Library, Cleveland, Ohio was flooded with the result that 40,000 books and 50,000 maps and periodicals were wet and muddy. Recovery costs were $540,000.

> 1977 - The San Diego, California Aerospace Museum and Library was totally destroyed by an arson fire in a $16,000,000 loss.[1]

> 1986 - The Los Angeles Central Public Library was set afire twice by as resea resulting in the loss of 400,000 books, and smoke and water damage to another 1,250,000 others.[2]

This manual is intended for those who are responsible for disaster planning in libraries and archives. The guidelines will assist by providing direction and making recommendations for preparedness and recovery. The suggestions will enable librarians and archivists to tailor the disaster plan to a local context, taking into consideration the collections, resources, and staff. The manual is limited to fire-and-water-related disasters involving books, manuscripts, and photographs. The main emphasis is on planning; the topics covered include the following:

- writing a disaster plan,
- contents of a disaster plan,
- prevention of disasters,
- protection of collections against disaster,
- response to disaster,
- recovery after disaster strikes.

The manual sketches the planning process, drawing upon experts who have had experience in disaster preparedness and recovery over the past two decades. Some advice will not be relevant for large institutions; other suggestions will be inappropriate for smaller ones. But guidelines stress the need for determined prevention and protection, and informed response and recovery. Finally, the manual suggests general principles of preparedness and recovery so librarians and archivists can adapt advice to suit individual institutions.

Written in two sections, (I) Disaster Preparedness and (II) Disaster Recovery, the manual urges **planning** for preparedness and recovery. Chapter One recommends ways to proceed with the disaster planning process, and details what a thorough disaster plan ought to contain. Four major areas for planning are emphasized in ensuing chapters.

Prevention - Chapter Two looks at ways disaster can be prevented by assessing potential hazards both inside and outside buildings. It suggests ways in which facilities can be constructed or repaired to assist with prevention. Prevention is encouraged as the least costly way to be prepared for disaster.

Protection - Chapter Three discusses steps and equipment helpful or necessary to protect collections against disasters. Protection measures identified for implementation result from the assessments carried out in the hazard surveys discussed in Chapter Two. Specific suggestions are made for protection against fire and water damage, for housing, and for environmental control. Staff vigilance and training are also emphasized.

Response - Chapter Four examines the necessary and appropriate planning which should be undertaken to be prepared for effective and immediate response to a disaster. It includes ideas for recovery alternatives and for priorities in planning for response and recovery. Recommendations are made for specific steps to be taken in initial reaction to collections emergencies ranging from a few wet items to a major catastrophe.

Recovery - Chapters Five, Six, and Seven provide assistance for recovery planning for fire and water related emergencies. Disaster recovery requires the most careful and detailed pre-planning if the effort is to be successful. Fortunately, recovery and rehabilitation techniques and methods have been tested and evaluated over the past ten year, and the best are described and assessed.

The advice compiled takes into consideration the needs of institutions and collections of different sizes and complexities. The manual is addressed to those who have the primary responsibility for collecting and providing access to books, manuscripts, and public records and for preserving those items. Librarians and archivists, whether they are located in urban areas or rural locations, are urged to undertake disaster planning, using this manual as a guide for designing and implementing a plan specific to their own institution and its needs.

A bibliography at the end of the manual provides opportunities to explore many of the suggestions and recommendations in detail in original sources. The appendices contain documents developed by other libraries which may prove of use for planning. Services, businesses, and experts are included for assistance in developing the best possible disaster plan.

Although planning for the safety of people is not discussed, it is always the highest priority. The procedures mentioned here are based on the assumption that a human life is more precious than the most valued of objects Emergency procedures for the safety and evacuation of staff and the public should be put into place even before collection planning commences. However, those guidelines are best planned and presented in a separate document to avoid confusion and to reduce the magnitude of the task.

Top and Bottom Photos: Books distorted and swollen by immersion in flood waters, Florence, 1966. Courtesy of Peter Waters, Library of Congress.

PART I. DISASTER PREPAREDNESS

CHAPTER ONE - PLANNING

A written plan is the single most important step in preparing for disasters First, such a written document acknowledges that disasters are possible, and that there is a commitment on the part of the organization to accept responsibility in a sensible and logical way. Second, preparation and a written plan eliminate panic, assure proper decisions, reduce the damage to collections, and limit the cost of recovery. Third, a plan consolidates ideas and provides step-by-step instructions which are clear and easy to follow for anyone who is called upon to use them. In this chapter specific suggestions for producing a disaster plan will be presented. The following chapters will then look in more detail at preventive, protective, and recovery methods and techniques.

Disaster planning can be divided into two phases. The first one is the planning process itself. It assesses collections, investigates hazards, sets priorities, and gathers facts. The result of the planning process is input for the second phase, the production of a written disaster plan. This chapter will outline and discuss the components in those two phases: planning and production

Preparing a disaster plan is not necessarily an easy assignment, depending upon the size and complexity of the library or archive. A key factor in the success of the enterprise is the endorsement of the administration for the priority of the task. This should be acquired before the planning is initiated to ensure successful completion of the project. No staff wants to work long and hard only to discover insurmountable roadblocks for lack of administrative understanding or support. An initial step may well be some thorough education to increase awareness of the need.

Once the plan is written, management must be willing to commit the financial resources required to make it effective. Consequently, the person assigned to head the planning effort should also be aware of the priorities of the institution as well as the fiscal resources which could reasonably be committed. However, since the planning process itself is almost cost free, involving only staff release time, financial concerns at this stage should not prevent the disaster plan from being produced.

A. Phase One - Process of Planning

The suggestions listed below represent important steps in the planning process. Each one is essential to ensure that a planning effort will result in a written disaster plan which will be appropriate to the institution in times of emergencies.

1. Assign Responsibility

One person should be assigned the responsibility of organizing and seeing the plan to completion. If a library or archive is very small, a single person may be all that is needed. In a larger organization, the staff member in charge should appoint a committee to assist in the effort, with himself or herself as head. However he/she decides to proceed, it is important that the individual understands the structure of the organization, its management, and staff. This understanding will ensure that the plan will follow established policies and procedures, and will be applicable to the individual institution. The head of planning also needs to be aware of the necessity for input from many internal as well as external sources as the planning proceeds through the various phases.

If a committee assists in the planning, it is wise to include members from a variety of library backgrounds. For example, cataloging, collection development, and public service staff provide invaluable input and experience as do building maintenance and security experts. Cataloging staff are aware of the implications of destroyed shelf lists or damaged access to the collections, while public service experts are invaluable for insight into continuation of service to the users after a disaster. Building maintenance personnel can point out all the hazards and peculiarities of a particular structure. Some committees have found that including, if only temporarily, fire and police experts have accomplished two tasks - gaining vital information, and educating those outside to the institution's needs and concerns. Additionally, some communities have civil defense experts who will have experience, and often shortcuts, to contribute and suggest.

2. Educate the Committee

If the topic of disasters in libraries and archives is new, either to the manager in charge or the committee, some background information and education will assist greatly in the planning process. In the bibliography at the end of this text are some general articles about disasters which have happened to others, and accounts of recovery projects, as well as more detailed information on the specifics of recovery techniques and research. Often inviting a consultant to talk with the planning committee will help in the education as well as the planning process. Sometimes something as graphic as staging a mock disaster will emphasize the importance of disaster planning and preparedness.

3. Define the Scope

Initially the committee should spend some time clearly defining the scope, or parameters, of the disaster plan. This will assist in focusing the effort and in drafting all the necessary details. Scope is dictated by a number of factors including the kind of institution in question, e.g., public, research, national, etc.; the size and complexity of the collections; the potential hazards, both internal and external; and the means and availability of services for response and recovery.

In defining the scope of the plan, the committee must also take into consideration whether to include recovery for contents of the building other than the collections themselves. In case of disaster there may well be damaged furniture, carpets, office equipment, computer terminals, and all the other fixtures comprising valuable assets. It they are part of the responsibility assigned to the disaster committee, additional recovery methods and expertise will be necessary.

4. Establish Goals and a Time Frame

Setting reasonable goals with objectives and a time frame for completion will assist in keeping planning on track and in providing a sense of accomplishment. Goals also allow for assessment of progress and the results of planning. They guide staff who may not be familiar with the details of disaster preparedness and recovery in seeing the direction the process is taking as well as what is expected at the outcome. The time frame should include reasonable completion dates for all the tasks being undertaken, many at the same time, and will allow the head of the planning process to organize the effort and control the result.

5. Set a Reporting Schedule and Lines of Communication

Progress should be reported regularly to institutional administration, first in the planning process, and later when specific tasks are initiated to assess the preventive and protective measures which must be undertaken. At the outset, lines of appropriate communication should be established. For instance, does the director want to see all reports from the committee, or would she/he prefer only periodic updating through another director or source? How should contact with building supervisors be handled? How should recommendations for improvements and preventive measures be handled? These and other issues should be established at the outset to avoid future conflicts or failures in implementation.

6. Assess Collections and Set Priorities

As part of the overall planning effort, it is necessary to look at the collections and assess their values - fiscal, historical, and scholarly - as they relate to the overall goals and intentions of the organization. This step provides guidance in setting priorities for protection and recovery. It is much easier to make those decisions in a calm and reasoned atmosphere than when faced with a major catastrophe. For instance, fire fighters may well ask where you want tarps thrown first over collections to protect them against water if there is a fire. If the primary goal of a college is to provide support for undergraduate education, then a first priority for disaster protection or recovery may be those materials which support this goal rather than the salvage of special collections or minor research collections. With input from in-house collection experts who know and understand the collections and their use, priorities can be set, and carefully recorded in the disaster plan, for the protection and recovery stages of its implementation. Planning also includes protection for the card catalog, shelf list, or other means of accessing the collections, as well as additional records required to keep the institution functioning.

The task can also benefit from advice from an insurance agent or risk manager when the monetary value of collections is being discussed. A practical if sober reality of implementing recovery techniques is knowing how much money would be available as well as what the materials may be worth.

If all collections cannot be saved, or at least not immediately, which materials are essential to the functioning of the organization and its goals? Institutions should consider a number of facts in the difficult task of setting priorities for protective measures as well as for recovery and salvage:

> actual monetary value of single rare and/or unique items
> the cultural responsibility for a unique item
> the scholarly value of an items or items
> value of a collection as a whole, for instance, an in-depth collection of French Literature, or the entire rare book department
> collections which support the major goals of the institution, such as research material for complex research facilities, or curriculum materials for teaching undergraduate courses
> collections which may be easily replaceable either by reprint or in other format like microfilm or fiche
> materials which are irreplaceable, such as original historical

documents or items which are out of print

> indexing and cataloging records or on-line programs which allow access to collections

> those items which are most easily salvaged e.g., the least damaged, or books and documents instead of fragile film-based media

> the least contaminated items in case of major flood or chemical exposure

After considering these ideas and additional local ones, the disaster committee, with continuing assistance from collection experts and directors, must set the appropriate disaster priorities for that particular library or archives. If the organization has several branches or buildings, each one should set its own priorities, and those in turn must be compared with the priorities of the entire organization. One department may decide its highest priority for protection and salvage is the shelf list, second, the periodical collection, and third its rare books . Another may want protection first for its maps or microfilm. If a library is small, the task of setting priorities may be more easily accomplished simply because the complexities of size and scope will not be present.

When priorities have been established, they should be indicated upon the floor plan for each collection, which will be a part of the appendices for the disaster plan. (This is discussed again in B.4 and B.11 in this chapter.) If security is a concern, for rare book collections, for instance, the floor plan need not be included in the general distribution of the disaster plan, but confined to designated authorities. If possible, the highest priority collections should be indicated on ranges or shelves as well as on the floor plan so they are easily identifiable by fire and security personnel. This can be done by discreet numbering or color marking on the ends of ranges or on individual shelves. It often helps in large stack areas, to post the priorities marked on the floor plan for each level or floor. With good planning and prevention, the need to employ difficult salvage priorities may never arise.

7. Determine Potential Hazards

Before a reliable disaster plan can be written, it is important to understand the potential hazards to the collections and to undertake strong preventive and protective measures. It is helpful in determining potential hazards in a library or archives to bring in outside experts who understand the technicalities of buildings and their services. Chapter Two examines hazard surveys in detail suggesting areas which should be examined regularly to prevent disaster. At this time in the planning process it is necessary to set up hazards surveys, create appropriate forms to be used, and establish the correct channels for communication. For a large institution, establishing a task force or sub-committee to carry out these surveys is a good idea to avoid slowing down the entire planning process.

The results of the surveys will provide objective information for the planning committee to consider and to make recommendations to the administration. Because surveys are part of the planning process, the results are usually not included in the written disaster plan which is intended as a guideline for future as well as present preparedness. However, the methodology, the staffing, the schedule, and any documents or recommendations for conducting future surveys, should all be part of the written disaster plan.

8. Assess Prevention and Protection Needs

Once the hazards to collections are understood by the planning committee, appropriate measures for preventing disasters which might result, and for protecting collections, can be developed. Assessing the results of the surveys, and setting priorities for the problems revealed, will aid in making appropriate recommendations for rectifying or alleviating potentially disastrous situations. Chapters Two and Three discuss in detail some of the major prevention and protection techniques and equipment. A good planning process report will include specific ideas for preventing potential disaster, financial and staffing implications, and suggestions for changes.

The assessment process should also take into consideration the most valuable materials and how they are protected, stored, insured, and exhibited. Some institutions have gone so far in planning that staff members are assigned a specific rare item to rescue in case of fire or flood, if that is possible without danger to the individual.

9. Develop a Written Disaster Preparedness and Recovery Plan

When the first eight steps of the planning process are completed, the committee should be well prepared to write a disaster preparedness and recovery plan which will include steps for preventing disaster as well as details for response and recovery if disaster strikes. Part II of this manual gives guidance on the details and concerns which should be addressed in the recovery section of every disaster plan.

10. Consider Fiscal Implications

Disaster planning is not expensive, and its costs are to be found mainly in staff release time. Disaster prevention and protection are more costly than planning because changes in maintenance, buildings, and equipment may have to be undertaken to eliminate hazards. Disaster recovery costs a great deal. Obviously, preventing disaster is of key importance, and risk managers or insurance experts can often assist in weighing decisions, and may even be able to offer reductions in premiums to offset costs of preventive equipment or improvements.

In addition to the resources required to dry, clean, repair, and restore disaster-damaged collections and buildings, there are immense hidden costs involved in recovery which are not so readily apparent. For example, all library functions may cease or be drastically reduced. Technical processing backlogs build up; staff morale plummets; and funds for collection development may have to be diverted. Careful thought ahead of time is needed to counter or deal with these possibilities.

The preparedness process must include some planning about finances, and the resulting recommendations sent to an administrative body for consideration. In planning for preparedness and recovery there needs to be some understanding, at the least, about where funds would come from for the immediate purchase of necessary supplies and services in case of disaster. This can be a specific emergency or contingency fund, or may instead be discretionary or special funds which could be designated for the purpose. Even if the library or archive sets aside only a very modest sum each year, eventually the accumulated savings could serve well if they were required for recovery.

The funding aspect for disaster recovery is especially troublesome for many public institutions which have no outside insurance. But no matter how troubling, the resources, or lack of them, which are available for disaster response must be understood by those held responsible for the success of a recovery effort. Alternatives to available funds for replacing damaged library materials can include the following:

- gifts from other institutions
- gifts from publishers
- gifts from donors
- grant or foundation assistance
- fund-raising efforts
- loans
- consolidation of collections from several libraries or archives

If none of these is possible, or if other funds are not available, then closing the library or archive will have to be considered as a last resort.

Sound planning and enlightened fiscal management will prevent the last alternative from ever happening. The management who fails to prevent and to prepare for disasters will ultimately bear the responsibility for the loss or the salvage of the collections in its care.

11. Distribute the Plan and Establish Staff Training

The disaster plan should be made available to all personnel in the library or archive, and to key security people outside the organization, such as police and fire staff. It may be appropriate to withhold particular parts detailing security, but the body of the plan is important for people to read and understand. However, it is not enough simply to distribute the completed document. Meetings to explain its use and importance are the final step in the process to ensure an understanding of its significance. It should be required reading for all new staff, and brief explanations of the use of the emergency sheet should be made. Most importantly it will serve as the working document for a disaster emergency team. The function of this team will be explored in

Chapters Three and Four. Finally, the plan should serve as the basis for meetings with fire and police experts, as well as those within the broader institution, if appropriate. It is important for them to know how to use the plan to accomplish the best possible result if disaster should strike. Their advice and support will be some of the most valuable available.

12. Write a Final Report on the Planning Process

No charge of this magnitude is complete without a report on the process. The report should contain a brief statement of the charge to the committee, the goals the committee set, the methodology adopted, and the final outcome. It should include recommendations made by the committee, the actions taken, and a statement of any continuing responsibilities or tasks. And the report should thank everyone by name who contributed to the planning effort.

B. Phase Two - Contents of the Disaster Plan

Once the planning process has reached the stage of producing a disaster plan, there are basic components which should be understood and considered for inclusion. After thought the planner or the committee may decide particular steps are inappropriate or unnecessary, and ignore them. The key to good disaster plans is in the care and thought given to the process of developing them. In general, sound plans seem to include the following steps and information

1. Introduction

This statement should be general but brief describing the purpose and scope of the plan. It should also include any general instructions for the use of the plan, its revision, and the person responsible for it. A Table of Contents is important so information can be found easily and quickly.

2. Emergency Information Sheet

The sheet should be one page and easy to use, posted at every telephone, listing the immediate and correct steps to take for collection emergencies. This saves critical time and gives untrained staff brief and concise instructions on how to respond and what to do in case of an emergency. It should contain instructions for how to react, who to notify, what to do for the collections. An example could be the following.

" Water Damage:

a. if water is dripping on collections, have someone call the plumber using this number *(phone number)* then:

b. move the collections to a dry area, if possible. Do not place them on the floor or other exposed areas. If it is not possible to move them, follow instructions in (c):

c. cover the collections with plastic sheet stored in *(location)* then:

d. notify *(names and numbers)*."

3. Telephone or Reporting Tree

The plan must have an up-to-date list of appropriate telephone numbers or ways to contact key people and services (such as plumbers) in case of emergency. Backup staff should be included if possible. This list should be updated regularly, and a copy kept at the homes of all key personnel. (See Appendix A.3.)

4. Collection Priorities

The planning process identified collection priorities for preventive measures and for recovery. Once agreed upon, they should be outlined clearly for the use of fire and police personnel, as well as for recovery and salvage efforts, if that becomes necessary. All branches and buildings should be represented in the disaster plan with floor plans clearly marked to include priorities as well as other important information such as locked doors, stairwells, unusual security devices, anything which might assist response and recovery staff in reliable action. (See Chapter One, Section A.6.)

5. Prevention and Protection Measures

Once hazard surveys have been completed and assessed as part of the planning process, parts of the report may be appropriate in the disaster plan. Conclusions reached by the surveys, information about the facilities, the priorities for prevention, and suggestions for regular inspection are all suitable topics. Additionally, any standardized forms, communication lines, or continuing tasks the committee feels are important should be included. (See Chapters Two and Three)

6. Disaster Response Instructions and Plans

This section should cover in detail the correct response to collection emergencies. Unlike the instructions on the emergency sheet in Step # 2, these should advise management and the head of disaster response on the immediate steps for reaction to a disaster. (See Chapter Four.)

7. Disaster Recovery Instructions and Plans

This section will be the largest and most carefully prepared in the disaster plan. In the event of a disaster, the recovery of the collection will depend to a great extent upon how carefully and knowledgeably the committee and the organization prepared themselves. Priorities must be clear. Techniques must be understood for salvaging the varieties of media. Services and methods must have been identified ahead of time. (Chapter Four offers state-of-the-art ideas for assistance in planning for disaster response.)

8. Resources

The plan should contain a section, perhaps in the appendices, listing resources the institution can call upon. These should include conservation experts, librarians, and conservators with experience in disaster education and recovery as well as centers or libraries with conservation departments who can give advice. Businesses and services should be identified and listed with phone numbers and addresses, as well as a key person to contact in times of crisis. Sources of needed supplies such as boxes and plastic sheet should also be included. Chapter III, Section F lists the supplies which should be on-hand as well as those which will be required for disaster recovery. (See Appendix A.3.)

9. Rehabilitation After Recovery

After materials are recovered from a disaster, they must still be cleaned, housed and stored properly, rebound, possibly recatalogued, and in some cases replaced. Thought should be given to this stage of planning for recovery. Questions such as continuing service for library or archives users, replacement sources, labor and financial resources should be addressed. (See

Chapters Five and Six.)

10. Appendices

The floor plans for all the departments and branches, any instructions which do not fit well into another section, and diagrams, forms or guidelines to be used for future planning and prevention should be included in the appendices. (See Appendix A.10,11.)

11. Bibliography

The bibliography lists basic resources for education in disaster preparedness and for recovery. Those items mentioned should be available for staff to read. Although the bibliography included at the end of this book is long, a few appropriate items could be obtained to keep on file and to assist in planning and preparing.

The whole disaster plan will require inspection and revision periodically as phone numbers, services, and technologies change. It is useful to include the mechanism for updating as part of the general instructions for implementing the plan.

Top Photo: Distorted shelves and destroyed collections exposed to fire, Los Angeles Central Library, 1986. Courtesy of Michael Leonard, Los Angeles Public Library.

Bottom Photo: Collections and shelving subjected to fire. Courtesy of Peter Waters, Library of Congress.

CHAPTER TWO - PREVENTION

Sensible prevention is the backbone of disaster preparedness. In this chapter ideas and procedures for assessing buildings and collections for desirable preventive measures are suggested. Once such assessment is accomplished, decisions can be made **about** preventive measures and/or equipment to accomplish the kind of protection desired. Chapter Three will examine in detail the protective measures which should follow the identification of potentially disastrous situations or practices. Within the means of the library or archive, everything possible should be done to protect the collections from emergencies. For libraries and archives located in rural areas, or with limited resources, recovery from a major disaster may be nearly impossible. In this case, prevention becomes an imperative. If more costly preventive alternatives are not possible, e.g., fire suppression systems, then staff care and vigilance must be planned and implemented to help reduce the risks. Commitment is the key. Inquiries to institutions similar in size and scope to one's own may reveal prevention techniques which could be adopted.

The first step in planning and carrying out good preventive procedures is a survey of hazards. This includes both external and internal surveys carried out systematically and regularly. The disaster plan should contain details of what the surveys are to note, and how they are to be carried out. It is helpful to develop standard forms to be used. (See Appendix A) This makes the task easier, and assures uniformity and objectivity of information, which is important if comparisons are to be made. In the disaster plan appropriate sources, to whom the results of the survey are reported, should be established, and directions for carrying out action items noted, so any required follow-up is completed. For instance, it may be noticed during a survey that a window is broken and requires repair. A procedure for notifying the maintenance staff and for being informed when the repair has been completed is important.

On the other hand, a collection hazards survey for smaller organizations may simply be a methodical and regularly scheduled walk-through by a staff member who notes problems which require attention, and assigns responsibility for action.

A. External Hazard Surveys

In order to prevent disaster, or reduce the impact, it is important to understand the potential external risks to the library or archive. For instance, is the area subject to tornado, hurricane, or earthquake? Is the library or archive located in a flood plain or an area buffeted by fierce tropical storms? Are extremes in temperature and humidity something to contend with? Are good maintenance procedures observed at all times? Any or all of these factors should be addressed in the disaster plan, and all possible provisions made to prevent damage to the building and its contents. In larger institutions there may be building and grounds staff who can assist with surveys, and whose job it is to follow through. Good communications with them are important. The survey should include the following in addition to local concerns. (See Appendix A.1.)

1. Initially, consider the location of the building as it relates to topography and weather: are there streams or rivers which are potential hazards, high winds, exposed location, earthquakes? Is the building vulnerable to external fire

conditions such as brush fire?

2. What is the risk of water affecting the building: can water used to irrigate plants or shrubbery leak into or permeate buildings or foundations? Are there fountains or fire hydrants which could pose problems?
3. What is the position of trees near the buildings: are their root systems or large branches potentially hazardous?
4. What is the condition of the roof, gutters and flashings: do they leak, is the roofing material sound and adequate, when are they cleaned, what is the repair and maintenance schedule?
5. How adequate are the drains and sewage systems: are they cleaned regularly, do they drain away from the building, will they back up, and if so where and under what circumstances, can valves be installed to prevent this, what is the repair and maintenance schedule?
6. What are the condition of skylights, windows, and doors: is caulking sound, are frames and glass in good repair, are locks secure and adequate?
7. What is the condition of the building material: is the mortar sound, the wood painted and free of dry rot or termites, stonework free of defects?
8. How are the foundations: do they appear sound, are there any large cracks or missing portions?
9. Is all debris kept cleaned up and disposed of properly: incinerators covered to prevent sparks or burning debris from escaping?

10. Are book drops utilized: if so, is the building protected against incendiary devices which may be thrown into it?

Common sense and a watchful eye can often eliminate potential external hazards. It is tempting during a dry season not to attend to the loose shingles on the roof, or a dangerous, overhanging tree limb, only to regret the error in judgment when an unexpected storm peels away the corner of the roof or blows the limb through a window.

Once hazards are understood, it is necessary to initiate the changes required to eliminate them. If there are many, or if changes are costly, it may take some time. It is important to set priorities for authorities, to present the facts and the desired results in an objective way, and to be persistent in a professional manner until the repairs are completed.

B. Internal Hazard Survey

Surveys for hazards inside buildings may be more difficult to conduct simply because of the complexity of collections and furnishings. Again, it is necessary to establish in the disaster plan responsibility, frequency, and reporting lines. As with all disaster preparedness and planning, common sense is the most useful ingredient. Standardized forms for the survey will assist in a methodical and much more efficient system. Elaborate surveys can provide the facts required to make changes in larger institutions, while other collections may require only a sensible and regular check for the more obvious hazards. For more extensive surveys, outside expertise may be necessary, e.g., to assess wiring and plumbing reliability. Internal hazard surveys in general should cover these concerns. (See Appendix A.1,2.)

1. Notice the ceilings: are they sound, do they show water stains?
2. Look at the building: is the internal construction sound, are there any large cracks or gaps, are walls waterproof, supporting walls intact?
3. Examine the windows: are they sound, do they have locks, are they closed when appropriate?
4. Investigate the pipes and plumbing: are they sound, are drains working, are there any leaks in facilities or pipes, are there valves to prevent backup, do pipes run over or through collections, are joints sound, are there signs of leaking or sweating
5. Examine the heating and ventilating system: is it checked regularly, is it cleaned, are pipes or radiators exposing collections in any way?
6. Look at the electrical wiring: are there exposed wires, inadequate outlets or wiring for the use placed upon them, are there too many multiple plugs, is there inappropriate use of appliances?
7. Check out the air-conditioning system: is it serviced regularly, are collections endangered by pipes, is the location of the system a potential danger to collections, e.g.,on the roof?
8. Look at facility storage: is shelving braced properly for safety as well as for potential problems such as earthquakes, are collections in process stored off the floor on pallets, shelving, or book trucks, is it appropriate for supplies?

9. Check fire and smoke detection systems: are alarms, smoke detectors, or particle detectors present, is testing conducted regularly for these devices, are alarms wired to a central monitoring facility, are annunciator panels marked and easily located?
10. Check fire suppression equipment: is there any present, if so, is the system present in good condition, are pressure alarms wired to a central monitoring facility, are the system or systems tested regularly?
11. Check water alarms: if none are present, are they needed, are they wired to a central monitoring facility, are they in good repair, placed appropriately?
12. Verify the existence of construction and floor plans for the building and its services: are they readily available and updated, are gas main and electrical boxes clearly marked, are staff trained to turn off services or are contacts available to do so readily?

The costs of removing or reducing some internal hazards may be considerable, as with external hazards and their correction. Once needs are identified, priorities can be set, proper protective measures suggested, a timetable noted, and costs estimated. Simple hazards such as trash pickup may only require education or arranging a better schedule. Others may need a staff member's time to identify proper authorities, such as those responsible for turning off water or gas. Still others may require major fiscal planning such as a fire suppression system.

There is another word of caution. A number of library disasters have been caused by careless workmen who do not understand the fragility of the collections. No matter how well meaning, all strangers working on or in the building require regular supervision to prevent fire or water damage. Holes in roofs will be left uncovered. Welding torches will be used carelessly. Water will be sprayed thoughtlessly. Windows will be left open. Security doors and alarms will be turned off. One should never take for granted that strangers will have the same concern for collections as those preserving them have.

C. Environmental and Housekeeping Hazards

Environmental and housekeeping concerns are usually considered preservation steps for extending the life of collections. Attention to these hazards can also reduce extremes which could result in a disaster to the materials housed in libraries and archives. Excessive temperatures and high humidity can encourage a massive mold outbreak. A dripping pipe is a signal that a rupture is imminent. These problems, and others like them, must be noted and dealt with.

The conservation/preservation literature contains many references to articles offering sound advice for ideal environmental conditions in libraries and archives. While examination of environmental issues for preservation is not the purpose of this manual, suffice to say that extremes or fluctuations in them can precipitate the greatest of silent disasters by triggering the acceleration of deterioration and degradation of library materials. It should be a responsibility of any disaster committee or planner to encourage administrators to reduce environmental hazards as swiftly and sensibly as possible.

While most institutions will have a personal list of known hazards, those noted below ought to be considered part of any survey.

1. **Trash:** are there regular collections, is waste disposed of properly and promptly, are hazardous materials stored safely?
2. **Aisles, exits and doorways:** are they unobstructed and well-marked?
3. **Fire doors:** do they function, are they kept closed if not triggered by alarms, do staff ever leave them propped open for ease of movement?
4. **Flood doors** (if needed): do they function, are they kept closed if not triggered by alarms, do staff ever prop them open for shortcuts through the building or to ease movement of collections?
5. **Collections:** are they stored properly off floors, away from damp walls and basements, away from strong light and excessive exposure to dust?
6. **Nitrate film:** is it identified and stored correctly, are the proper steps known for safe disposal?
7. **Eating, drinking, and smoking:** are restrictions clear and enforced?
8. **Shelving of items:** is there appropriate housing for different formats and sizes, are bookends used, are items too crowded on shelves, are there guidelines to protect from physical abuse by users?
9. **Dusting and cleaning:** do cleaning staff follow the set local standards , are proper procedures observed, appropriate supplies used?

10. **Strong light:** are collections exposed inappropriately to direct external light, is light controlled to the best of your ability within the library or archive by use of timer switches or ultra- violet shields , are proper exhibit standards for materials observed?
11. **Temperature, humidity, and air pollution:** is it monitored and controlled, if not to ideal standards, at least to the best of your ability, is the equipment for control clean and functioning? If expensive systems are not possible, do you keep the air moving with ceiling fans or other methods to prevent mold forming in dead air pockets ?

When hazards surveys are completed, results should be compiled and a report written indicating those areas where hazards have been adequately protected against, and those areas where preventive and protective measures still must be taken. Priorities should be suggested and cost estimates included, if there are many preventive needs identified through the hazards surveys, before the report is submitted to administration. A task force formed by the head of the disaster planning committee may be appropriate at this point to pursue solutions to the hazards identified.

A timetable should be established in the disaster plan for the regular rescheduling of hazard surveys. The follow-up will be easier each time as hazards are gradually eliminated or reduced.

Once staff becomes accustomed to the need for vigilance and a critical eye, many of these concerns will be noted and maintained or reported automatically. Others, if important to effect, may require a persistent and even educational effort to bring about change or improvement. Objective reporting and the citing of examples from other institutions will be more effective than negative criticism.

D. New and Remodeled Buildings

Another effective way to prevent disasters is in careful planning for new or remodeled buildings. Library and archival professionals can and should influence architects and engineers, insisting on good preventive measures and design. Deliberately building a library in a flood plain is not sound management or common sense. Failure to install proper fire protection equipment is taking unwise chances. If funding is difficult, additional sources should be pursued, with consultants called upon if necessary, to emphasize reasonable requests. There are a number of experts who are available to assist libraries and archives in responsible preventive planning.

When libraries and archives are being designed, many potential hazards to collections can be eliminated, and proper preventive equipment and services can be installed for much less cost than would be true in retrofitting older facilities. Buildings should be designed to prevent strong light from damaging collections and fading furnishings. Some modern facilities, like the Newberry Library in Chicago, Illinois, have been designed without windows to reduce the hazards of excessive light, and the problems of controlling the internal environment. If windows are present, glass should be installed instead of shutters or grille-work to reduce weather, pollution, insect, and mold hazards.

Environmental control systems can be planned for specific needs and climates, and placed in areas away from collections to reduce potential damage.

Heating and ventilating systems should have the proper safety mechanisms including the capacity to shut down immediately in case of fire or smoke. All water and steam pipes should have pressure alarms installed to warn of potential trouble.

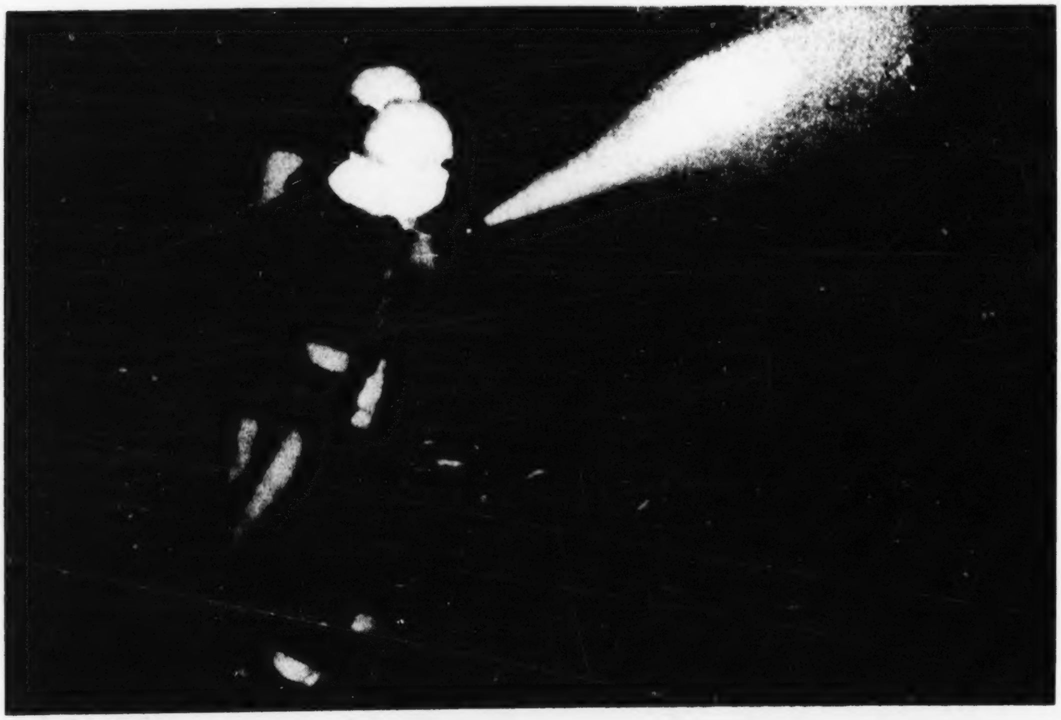
Proper and safe shelving can make the best use of space and collection requirements. If carpets are to be installed, they should not run under shelving. In case of water disaster they can then more easily be dried or taken up. Security for collections should be considered with the most valuable assets in the collections properly housed and protected from abuse, theft, and disaster.

Serious consideration should be given to the materials used in the construction of buildings as well as in its furnishings. Non-combustible materials which have passed fire safety testing and codes can help prevent fire from spreading. In addition, the hazards of heavy smoke and destructive soot can be reduced considerably. Library stacks should be designed or improved to eliminate open areas or gaps between levels. In times of fire these gaps provide oxygen, which turns the library or archive stacks into a chimney, resulting in greater damage. Local fire authorities or a national fire protection agency can often offer advice and recommend information for the best fire prevention planning.

The old adage that "an ounce of prevention is worth a pound of cure" is never more true than in the case of library and archival disaster planning and prevention. The next chapter will look in detail at protective measures and equipment which can assist with active and responsible disaster prevention.

Top Photo: Los Angeles Fire Department fighting Central Library fire, 1986. Courtesy of Michael Leonard, Los Angeles Public Library.

Bottom Photo: Fire fighters misting library fire, 1986. Courtesy of Don Hartsell, Airdex Corporation.



CHAPTER THREE - PROTECTION

Protection is the result of action taken to prevent disaster. Once collection hazards are understood, and measures to minimize disaster are decided upon, protective steps can be initiated. They may call for patience and education on the part of the disaster planner or committee because protection often requires time and money to make the improvements which can prevent damage. Some of the difficulty in implementing protective measures is that there are no guarantees that they will prevent disaster, only that they will reduce risk or limit the damage if disaster strikes. Administrators will have to weigh the risk against the cost of protection.

But as the hazard surveys will uncover, there are many improvements which cost little, such as storing collections off the floors. And other improvements which can be made while more expensive recommendations are considered. For instance, if the recommendation is a major one, such as a new roof, protection planning should include what to do to preserve the collections against water damage until a capital improvement can be undertaken. The interim measure might be to move collections, or to cover ranges with sheets of plastic, or to suspend plastic directly under the roof, supporting it appropriately for safety to staff and users. If an air-conditioning system seems advisable to prevent fluctuating temperatures, humidity and mold, ceiling fans will assist in air circulation until money is available.

In a complex library system, with many branches or large collections, the disaster planning committee may want to charge task forces with responsibility to carry out one or more of the protective measures identified.

An example for a task force charge might be to investigate appropriate fire suppression systems for a library, outlining recommendations and costs. In more modest collections the job of providing protection can often be accomplished by one person communicating needs to the proper authorities and following up on the action required.

The information in this chapter represents important protection measures found to be effective and helpful by librarians and archivists in preventing or reducing the effect of potentially disastrous situations. Water and fire detection and protection equipment will do much to eliminate a true disaster. Supplies on hand to assist in response to emergencies provide opportunity for more timely reaction. Staff who are well-trained are among the best protective measures available, because they can be trained to handle emergencies correctly and competently, reducing the risk considerably.

A. Human Resources

When thinking of creative ways to protect collections, examine the wide variety of human resources available. Choose those which would be possible for you to contact or whose services you could use, write or call them, and include them in the disaster plan with their permission. Periodically check in with these resources to make sure they are still in business, are still willing to assist, and that you have their current phone numbers. Obvious resources include fire, police, security, insurance, building maintenance, and business people. But also remember professional librarians with experience in disasters, conservation/preservation experts, conservators - both library and art - political representatives, institutional experts in your organization or others, and finally the national or international library and archival community. Librarians and curators in Florence, Italy made expert use of this approach after the flood in 1966. Also, many of these experts will be willing to share the disaster plans of their own institutions as examples.

In addition, do not forget the experts within your own library or archive who can simplify the process of planning using their knowledge of collections and users. They will understand which materials could be replaced easily and which are priceless. They will know which are printed on coated paper and thus apt to stick irretrievably if they become wet. They may also have colleagues at other organizations willing to cooperate mutually in case of disaster. Administrators can provide an overview of goals, financial realities, and links to higher administrations in the organization or government.

B. Water Detection Equipment

If your library/archive is susceptible to flooding or water problems, water detection devices will be a good protection. There are a variety on the market from companies dealing with library security as well as computer facility security. (Libraries have also made their own with sponges and electrical contacts.) Some alarms are self-contained and will ring only locally. Others can be wired into a centrally monitored security facility. The latter cost more both to buy and install. But they are more effective than local alarms because no one may be around to hear alarms in remote locations or when the facility is closed. It is also important to have pressure alarms attached to major water pipes to alert security or staff to a water release, either because of a fire or pipe rupture. Water detection alarms are often placed in the following locations:

1. the most susceptible areas , e.g., basements, near drains, etc.
2. areas where water is likely to appear first in case of flood,
3. in the most valuable or easily damaged collections,
4. areas where valuable equipment, like computers, are located.

C. Fire Detection Equipment

The most valuable steps a library or archive can take for protecting the collections are to install fire detection and suppression systems. They can be as sophisticated as fluorocarbon gas or as simple as a reliable night watchman trained to fight fire. But some protection is essential.

For many years librarians and archivists believed their collections would not burn easily. Whatever the case may have been in the past, it is quite clear that modern construction materials, man-made fibers, and plastics all burn quickly and readily, producing deadly gases. Add to this large drafty corridors and stairways, stacks with open construction and vast areas, and the potential for fire is explosive.

Another sobering fact is that by far the largest percentage of library fires is caused by arson. John Morris estimates this may be as high as 75-80%![3] Librarians and archivists simply cannot afford to take chances. Buildings must be planned with fire safety in mind. Security must do all it can to prevent entry by unauthorized persons. Book drops should be protected with fire suppression systems or be isolated from the building itself. But even the best of prevention and protection measures are not enough. Libraries must be equipped with a swift and efficient way to smother fire. In April 1986 the Los Angeles Central Public Library suffered a devastating arson fire and loss to collections in spite of the fact that one of the best fire departments in the world was located nearby and was in the building within fifteen minutes. The intensity of the fire caused it to spread rapidly among books and microfilm. Even with the most sophisticated equipment, fire fighters worked for eight hours to extinguish the fire, and were busy for several days afterwards putting out hot spots. The library had no sprinkler system. The local fire chief stated quite clearly that if there had been a suppression system in place, the fire would never have gotten out of control.

The decision that must be made is which system of alarm and suppression is the best for the collection you are dealing with, and for the budget available to you. A part of the decision process is understanding that recovering from a water disaster is much easier and more successful than trying to recover from a disaster involving both water and fire.

In addition to fire alarms, some institutions will wish to consider intrusion or security alarms to provide protection from theft as well as internally-caused arson fires. There are many alarm packages available which will monitor all security concerns from intrusion to fire to environmental control systems. Some institutions will find a watchman is sufficient security, others will require more sophisticated protection.

Alarms to detect the presence of fire ideally should be wired to a central monitoring station, as should water alarms. Choices of equipment vary and may be selected according to need:

1. **Ionization detectors** react to the gases produced in the first stage of fires and are particularly suited to early detection in any libraries and archives.
2. **Smoke detectors** respond to visible smoke and are sometimes

called particulate detectors. They are also recommended for early detection in any library or archives.

3. **Flame detectors** sense infra-red radiation from fire, and are suitable for areas where fires could develop quickly because of vast space or strong air movement.
4. **Thermal detectors** respond to temperature, and can be acquired for fixed or rate-of-rise temperatures. These detectors are especially good for collections of film-based media which are quickly damaged by rising temperatures.
5. **Linear beam detectors** use an infra-red beam to detect smoke.

D. Fire Suppression Systems

If suppressions systems are chosen to prevent fire from spreading, the hazards of the building, the collections themselves, and the costs should all contribute to the selection process. Advice from fire experts and fire insurance carriers is recommended. Fire suppression equipment is available for all varieties of needs and applications. Additionally, the equipment should be tested periodically to ensure the sound condition of the system. (Obviously this does not meaning turning on the sprinklers themselves. Experts can test without this damaging step.)

1. Manually Operated Equipment

a. Standpipe systems, both external and internal, are those to which fire hoses are attached by fire fighters. Only trained personnel should use fire hoses because they can cause great damage to collections and the contents of buildings.

b. Portable extinguishers are designed to fight specific classes of fires and can contain water, gas, or chemicals. It is very important that extinguishers which are appropriate to library and archival materials be used. Pressurized water extinguishers are suitable for wood and paper fires, but should never be used for electrical fires or on flammable liquids. Obviously they will wet collections. Halon 1301 or 1211 is best for library and archival collections because it does not damage these materials at all, but these extinguishers are more expensive. Carbon dioxide is quite suitable for electrical fires, but is not as effective for wood and paper fires Dry chemicals will extinguish any fire, but will leave a residue behind which may be difficult to remove from collections. If fire extinguishers are present, staff should be trained to use them properly by fire personnel.

2. Gas Systems

a. Carbon dioxide is effective but not recommended for public access areas as it will also asphyxiate people.

b. Halon 1301, a gas whose name is trademarked by Dupont Corporation, is very effective and relatively harmless to humans for short exposure times. But it is expensive, requires a relatively small and enclosed room to be effective, and is usually employed for museums, special collections, rare materials, and computer facilities.

3. Automatic Water Systems

a. Wet pipe systems have individually activated sprinkler heads attached to pipes which contain water at all times. Once triggered, the system must be turned off manually. Except for inappropriate deluge systems, this is the least expensive of the water system alternatives available.

b. Dry pipe systems have individually activated sprinkler heads attached to pipes which contain gas or air under pressure. Once triggered by the presence of fire, and water is released into the pipes, the whole system must be turned off manually. Action is slower than wet pipes and more heads may be triggered. This system is especially suited to cold climates where pipes could freeze. It does reduce the danger of leaking pipes or damaged sprinkler heads triggering, but the time required to fill pipes for action causes delay in response.

c. Pre-action systems have sprinkler heads attached to dry pipes into which water flows when fire is detected. This system reduces the chance of malfunctioning sprinklers damaging collections. Once triggered, water must then be shut off manually.

d. Pre-action firecycle systems are similar to a pre-action system, i.e., sprinkler heads are attached to dry pipes, with one very important exception. The system is prepared to shut off the water automatically when the fire is out, and open it again if more water is required. They reduce water damage.

e. Aquamatic sprinklers (on-off) are attached to pipes charged with water. Each sprinkler head turns itself on, then off, then on again as needed. This greatly reduces water damage. This water system is the most expensive alternative.

f. Deluge systems are those in which all sprinkler heads are triggered at once, whether required or not. These systems are not suitable for cultural institutions because of the water damage involved when they are triggered.[4]

4. Other Systems

a. Different kinds of foam are often used in industrial fires in large buildings. They could also be effective for libraries and archives if the correct foam is employed. Aqueous film-forming foam does not harm film-based media or phonograph discs.

b. Dry chemical systems are not recommended for cultural institutions as they were developed to fight chemical and industrial fires and would seriously damage collections.

E. Supplies for Protection and Recovery

A stockpile of supplies, held locally and easily accessible, is a sound protective measure. These may be modest in number such as a few boxes to pack wet books, some plastic sheet to cover materials in case of water leaks, and plain paper for interleaving wet books. Ideally, to be well protected, the store of disaster supplies should also include what is required for initial disaster response. The supplies should always be available for use and not stored in a locked area with limited access. All departments and branches should have a few early response materials, and a larger stockpile should be held centrally. Periodically, and especially after use, the stockpile should be inventoried and replacement supplies ordered immediately. The list below represents supplies found convenient to mount an effective, initial disaster response.

1. plastic to cover collections to protect them from water; polyester film to support wet manuscripts
2. pails, mops, buckets, brooms, and industrial vacuum cleaners to clean up water and mud
3. portable generators, pumps, portable battery-powered lights, battery-powered radio
4. fans, dehumidifiers, industrial extension cords
5. sling psychrometers or hygrothermographs to record temperatures and humidity
6. paper supplies including freezer wrap, notepads, clipboards, clean paper or paper towels for interleaving wet books, clean blotters, tape to make boxes, heavy cardboard for supporting wet items
7. pencils, indelible pens for marking boxes
8. cutters containing changeable razor blades for cutting paper, freezer wrap, etc. (scissors are not good as they dull quickly)
9. gloves, protective helmets, protective clothing such as heavy plastic aprons or industrial strength coveralls, sturdy water-resistant shoes

10. boxes or plastic crates for packing wet books
11. new plastic garbage cans to wash materials, plastic trays to wash items
12. sponges, hoses, brushes for cleaning materials
13. portable tables for work stations
14. fishline or fine clothesline for hanging books or documents, clothespins
15. chemical rubber sponges for cleaning dirt, smoke, and soot
16. well-equipped first aid kit
17. book trucks for transporting materials
18. pallets upon which to stack boxes for transportation
19. a set of basic tools including hammer, screwdriver, pliers, crowbar

Not all institutions will require or can manage all these supplies. Perhaps several organizations can cooperate to stockpile supplies in a location accessible to all. The essentials can be decided upon by the disaster planning committee and included in the appendices for the disaster plan. It is clear that certain supplies like plastic tarps, boxes to pack wet materials, and paper to use for air-drying are advisable for every library or archive to have on hand, if possible. Beyond that, decisions can be made based upon potential for disaster and availability of local supplies. (See Appendix A.4)

F. Training

Training is an important component for the success of the disaster plan, and especially of the recovery effort, if disaster should strike. The chapters on recovery will emphasize the responsibilities of staff in that effort. But successful staff training in the entire disaster planning process involves much more that just recovery. Once again the importance of practical planning, prevention, and protection should be emphasized. In the planning and prevention chapters the roles of internal staff and their contributions were noted as essential for a comprehensive understanding of all aspects of the collections as the disaster plan was developed. This is as true of smaller collections as larger ones. Once past the staff contribution stage in planning, staff take on another significant role. It is as active or potentially active participants in implementation and recovery. Steps for disaster organization and education have been developed and employed by a number of institutions. A compilation of the best are listed below.

1. **Hold one or more training sessions** to introduce staff to the disaster plan and its use. Examine carefully with them the proper procedures for notifying the appropriate people if disaster strikes, and the steps to follow to help protect the collections. The education of new staff should include training to use the emergency procedures sheet, and an introduction to the disaster plan.

2. **Name an official Head** of disaster prevention and recovery. Once the initial disaster planning is completed, this person will have the continuing responsibility to use the plan and follow through on its recommendations, initiate any on-going surveys, be responsible for a disaster recovery effort. The Head reports directly to the institution management. This person may be a conservation/ preservation officer, a good middle manager, the chair of the disaster planning committee, or one of the library/archival directors. Her/his

responsibilities are as simple or complicated as the collections and the situation call for.

3. **Train staff** or staff task forces to undertake disaster hazard surveys and to make recommendations. Keep the number or complexity of assignments to a minimum so they do not become a chore. Establish a regular schedule for surveys depending upon the disaster planner or committee's concerns about the particular hazard.

4. **Establish a disaster recovery team**, with a Leader, whose members can react knowledgeably to anything from one wet book to a major catastrophe. This is especially important for larger collections. Smaller collections may find that one knowledgeable person is adequate. Give members of the team hands-on training so they will know immediately how to respond to emergencies for all the kinds of materials the institution collects. Set up a procedure for disaster team members to act as team leaders in case of major disaster. Bring in experts if necessary to provide comprehensive training. If this is not possible, scrutinize the literature and provide your own training. Ask or write for advice from people with experience in disasters and in disaster training. Organize cooperative or regional training or disaster teams. Look into the possibility of outside funding to bring in experts to assist in education and training. Stage a mock disaster to practice response readiness and expertise.

If an institution is fortunate enough to have a conservation department, or access to one nearby, emergency treatment for individual items may not be necessary for the disaster team to undertake, and members can concentrate on training for major recovery efforts.

The Leader of the disaster recovery team is responsible for the team and its deployment once he/she has been notified by the Head of disaster recovery. (The procedure should be recorded in the disaster plan.) The Leader reports to the Head of disaster recovery and acts as liaison between the Head and the team.

5. **Meet with any outside personnel who may be called upon to** assist in disaster recovery. Firefighters who are not trained to work with fragile cultural material will need to know what your expectations are in case of disaster. Careful communication ahead of time will prevent books from being thrown out of windows or unnecessarily doused with fire hoses. A request for misting with fire hoses instead of blasting will prevent books and documents from being torn to shreds by the force of the water. If books are removed from the premises for freezing or storage, truckers and others need to understand about careful handling and security.

Staff training is an important component of a good disaster plan. Proper attention to prevention and protection hazards as well as appropriate reaction to emergency situations can make a significant difference in reducing damage. Staff training should be scheduled periodically for permanent staff, and one aspect of the education for new staff in a library or archive.

G. Controlling the Environment

Environmental and housekeeping hazards were discussed in Chapter Two, Section E including the way they contribute to conditions which could lead to disaster. Many libraries have found the steps listed below help protect the collections against these emergency-causing conditions which are less obvious and dramatic than fires and floods. These suggestions provide only very basic information which is included to encourage further investigation. Additional details should be pursued to reach an understanding about the significance environment can have upon library and archival collections.

1. Although standards for ideal temperature and humidity are under investigation, and recommendations may change, a reasonable goal to strive for is 20 degrees C., plus or minus 2 degrees, and between 40 and 45 percent relative humidity. This temperature and humidity should be acceptable for general collections containing a variety of materials. Most importantly, extreme fluctuations in temperatures and humidity should be eliminated. They cause distortions of bindings, stress on paper, and observable damage to photographs. The best climate-control system will be zoned to take into account the temperatures and humidities required, as well as present, in different areas of the library or archives.

2. Temperature and humidity should be monitored. This is often done by automatic thermostats, but such a gross measurement does not begin to indicate what is happening in smaller areas of the stacks or building. Additional monitoring should be undertaken if disaster is to be prevented and collections protected. Monitoring can be accomplished either by recording on a hygrothermograph, or by taking regular readings using a sling psychrometer. If neither of these is available, a less effective means to monitor is by installing a minimum/maximum thermometer and a good hygrometer. Temperatures and humidity can then be checked several times a

day and recorded by hand. Potentially serious problems such as extreme humidity in photographic collections can easily be determined and rectified by the use of dehumidifier, or by dessicants placed in boxes where photographs are protected by envelopes or sleeves. Dry conditions may be addressed by the use of humidifiers or pans of water place strategically.

3. Excessive ultra-violet light is particularly damaging to books, manuscripts, and photographs. An original photograph, exposed to strong light for as little time as twenty four hours will demonstrate irreversible damage - truly a disaster. Ultra-violet (u-v) light should be reduced by installing u-v filtering sleeves on fluorescent lights or u-v filtering plastic on light fixtures. Low emission fluorescent tubes are also available, although more expensive than regular ones. Ultra-violet filtering film may be placed directly on windows to reduce the effects of sunlight, or blinds or draperies may be employed. There is some indication that u-v filtering plastic or film may lose its effectiveness after a period of time. Manufacturers should be questioned closely about lifetime expectancy. The effect of strong light may be reduced still further by planting trees or shrubbery outside windows to block sunlight. (Unless watering will cause problems.) Finally, the use of blinds or draperies can be effective on windows where strong light is a problem.

4. Equipment for filtering the environmental dust and pollutants in the air should be checked regularly, filters changed, and effectiveness monitored as part of sound maintenance. Correct filters depend in part upon the pollutants and/or dust problems in a given area, and these should be understood before equipment is purchased.

Controlling environmental excesses will not only help prevent disaster, but they will also greatly prolong the life of the collections as well. If ideal systems cannot be employed, staff must make every effort to undertake creative local solutions to reduce potential collection hazards to their best ability.

H. Enclosures and Storage

Enclosures are a fine way to protect collections from disaster. The step is seen primarily as a general preservation measure. But boxes, envelopes, and wrappers also provide a barrier between an item and hostile environmental conditions. Experience has shown that in times of water and/or fire, protective enclosures can often make the difference between loss and salvage. No one can afford, nor would they want, boxes for all circulating books. But even plain, individual boxes for rare volumes can protect them from dust, handling, insects, and, most importantly, from water, smoke, and heat. It has been observed by more than one expert that simple book jackets made from polyester film are surprisingly effective in protecting books from smoke and heat damage, and to a lesser extent, fire. Documents of all kinds will be protected with good quality folders, document boxes, and polyester sleeves. Maps placed in drawers rather than rolled on shelves or hung on walls, survive disasters, often unscathed. The key is to remember that placing as many barriers between the collections and the disaster-causing event will buy time and reduce damage.

Every library or archive should attempt to the best of its abilities to preserve its collections in these ways. Not only do enclosures protect materials from disasters, but also they help prolong the life of the collections as well. Ideally, items should be placed in protective enclosures when they are received and before they are housed within storage or stack areas. A retrospective program of rehousing should also be undertaken, even if only modestly.

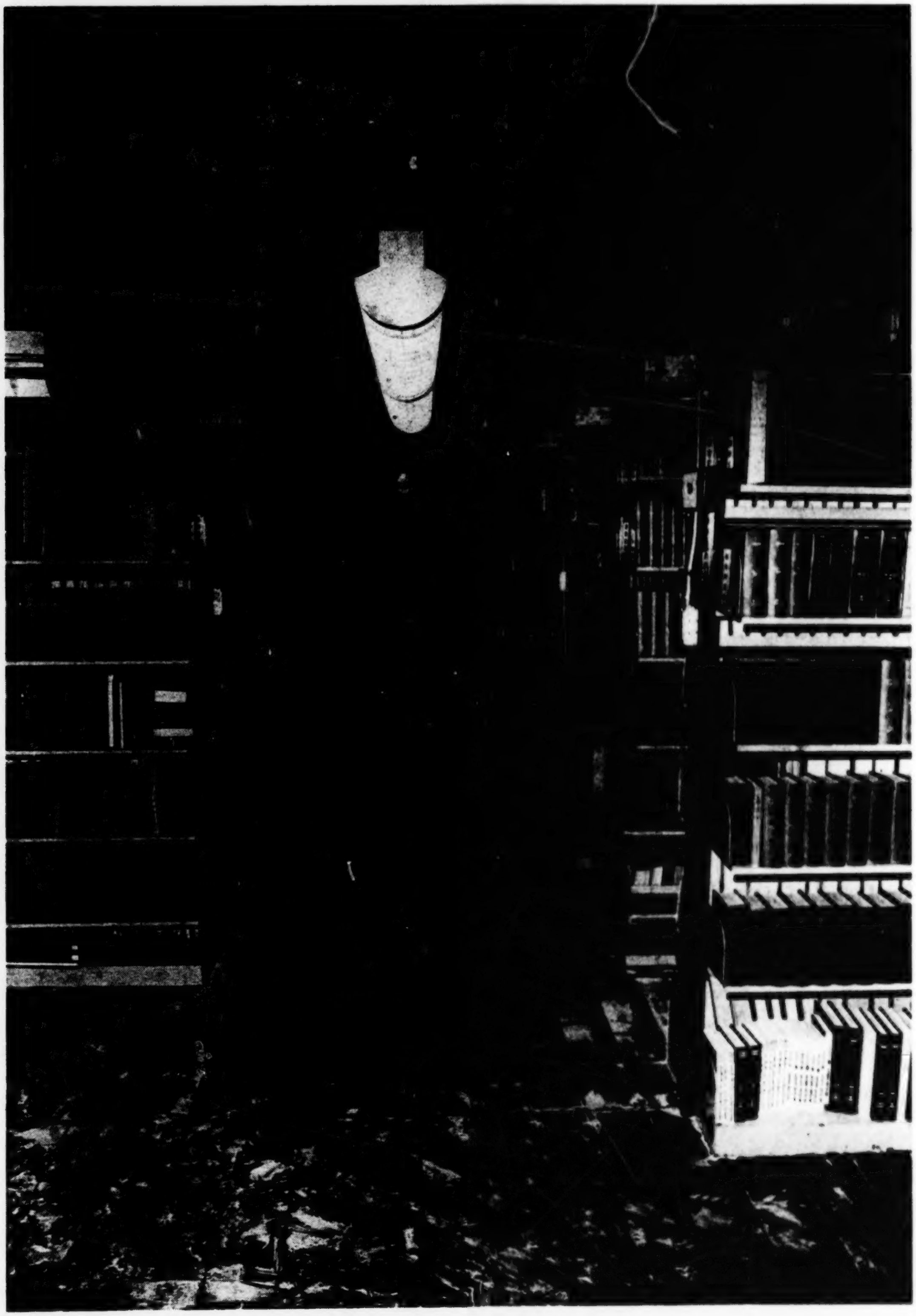
Protective enclosures can be made easily in-house, or may be purchased from vendors. Regional centers may provide the service for a fee. In any event, it is important that all enclosures be made of high quality, acid-free materials, which are not harmful to library and archival collections. Care should be taken when ordering enclosures, or the supplies to make them, that they are purchased from businesses who understand the available specifications and guidelines for sound conservation materials, and will guarantee their products.

Proper storage has been alluded to several times already in the chapter on planning as well as that on prevention. It is worth mentioning in more detail because good storage not only will prevent damage from emergency conditions, but also prolong the life of materials in general. Shelving should be made of sturdy, inert materials, free from damp, molds, and insects. Steel shelving coated with baked enamel is best for library and archival collections. If wood shelving is used, all surfaces should be sealed with several coats of an inert, long-lasting acrylic sealer to protect collections. In case of water or smoke damage shelves should be rust proof and easily cleanable, with a minimum of crevices where water can gather. In earthquake prone areas, shelving should be braced to withstand moderate shaking without buckling. If necessary, materials on shelves can be held in place with elastic cords or other restraining devices placed across the front. This is especially important for phonograph discs or other easily damaged collections. Bottom shelving should be placed at least four inches off the floor in case of minor flooding.

Materials should never, at any time, be placed on the floor, even for temporary storage. Volumes stored in boxes can withstand quite a deluge unless they are soaking up water from the floor. If shelving is unavailable, boxes may stacked on pallets or on boards placed on bricks or cement blocks. Books stored firmly (not tightly) upright on shelves, with bookends to support them, will be able to resist water saturation for a short time. If space permits, avoid placing books and documents on top shelves where they might be damaged by leaking pipes or roofs. Disaster experts dealing with the aftermath of fires in libraries and archives have noted that materials on top shelves are often burned beyond salvage, while those on bottom shelves are in good condition. If possible, this fact can be taken into consideration when housing collections, and more valuable, vulnerable, or irreplaceable materials can be placed on lower, but not bottom, shelves. For example, photographic media, which are more susceptible to heat, could be housed lower on the shelves than books. Easily replaceable volumes could be placed on top shelves.

Proper protection can quite clearly help prevent disaster. Once hazards are understood, protective measures can be recommended. If there are many such recommendations, priorities should be set to help address the most serious problems first. All librarians and archivists are urgently encouraged to do what they can to prevent fire, potentially the worst disaster which can befall a library or archive.

Cleanup of water and mud in stacks after a flood in preparation for removal of materials, Stanford University, 1978. Courtesy of Stanford University News and Publication Services.



PART II DISASTER RECOVERY

CHAPTER FOUR - PLANNING FOR RESPONSE AND RECOVERY

The recovery component of the disaster plan must be organized and prepared very carefully. For on this careful planning may rest the success or failure of the recovery effort. Examine the steps for response in Section B, and make sure the recovery plan includes details about how to address those concerns. If planning, prevention, and protection measures have been followed it will be clear that nothing further could have been done to avoid disaster Therefore, the job at hand is to initiate recovery in as speedy and organized a way as possible. It is hard to imagine, until one has been involved in a major disaster to a library or archive, the sense of shock and helplessness it generates. Even with experience, the immediate reaction is momentary panic about the loss and the magnitude of the challenge. This is true whether the disaster is relatively minor or calamitous. The potential outcome rests solidly in the hands of whomever has been named responsible for recovery. Careful planning and training are clearly of importance. So is the ability to rise to the occasion calmly and with assurance.

Over the last two decades a great deal has been learned about disaster recovery. The librarians and archivists to whom it has happened, or who have assisted in recovery, have been honest and open about sharing their experiences, both positive and negative. The failures have assisted greatly in finding better solutions. The successes have added to the knowledge about techniques which can be employed in the future.

Probably the greatest impetus for better planning and recovery procedures was the Florence Flood of 1966 when the whole cultural world was stunned at the loss and damage to materials. Conservators and volunteers flocked to Florence, Italy to help in the salvage effort. It was soon clear that better techniques for cleaning and drying books and manuscripts were required if, in the future , recovery was to be more successful at reducing major structural and aesthetic damage.

Over the ensuing decade, fires and floods affected libraries in many parts of the world. Notable are those in which new conservation/preservation measures were undertaken or improved to ensure more successful recovery results.

1. A fire struck the regional library of Gothab, Greenland in the winter of 1968. Frozen books and manuscripts were transported to Copenhagen by conservators where some underwent traditional air-drying, and others of historical importance were dried in vacuum chambers. The results of this experiment were promising. The attempt at more controlled drying proved to be a significant step in the recovery field.[5]

2. The Klein Law Library at Temple University, Philadelphia, Pennsylvania burned in the summer of 1972. The ensuing fire and water damage was catastrophic both in terms of loss and cost. Conservators Peter Waters from the Library of Congress, and Willman Spawn from the American Philosophical Society Library, worked with library officials and engineers from private business to improve drying techniques using vacuum chambers for frozen books and manuscripts.[6]

3. In the late summer of 1972 the Corning Museum of Glass, in Corning, New York, containing library and archival materials as well as museum artifacts, suffered the effects of a major hurricane. Severe flooding damaged all the collections. A variety of drying methods were tried for library and archival materials including air-drying, dialectic drying, and vacuum drying. Much was learned about the reaction, successful or otherwise, of film-based media as well as books and manuscripts to different drying techniques.[7]

4. In 1973 the National Records Center in Overland, Missouri burned. Again, conservators and research scientists in the Library of Congress Preservation Office were called upon to assist. Records, most unbound, were dried in huge vacuum chambers without freezing them first.[8]

5. In the winter of 1978 fire again struck a major collection, this time at the Sir Sandford Fleming Building at the University of Toronto, Canada. One significant result of this disaster was the statement by fire officials that the fine disaster plan had much to do with successful response and recovery.[9]

6. Flooding caused by construction equipment affected 50,000 volumes in 1978 at the Stanford University Libraries, Stanford, California. Vacuum freeze-drying techniques for water damaged books were improved with the assistance of engineers at a nearby space research and development company.[10]

7. In April, and again in September, 1986 arson-caused fires and subsequent water damage struck the Los Angeles Central Public Library in Los Angeles, California. Perhaps the single greatest library catastrophe in

modern times resulted in the loss of 400,000 volumes; water and fire damage to 750,000 more; and soot and smoke damage to an additional 500,000. The logistics and the techniques used in this disaster recovery will provide immense additional resources for future recovery efforts.[11]

A. Recovery Issues

The planning process for recovery , undertaken by the disaster planning committee before a disaster occurs, must consider some general collection issues and alternatives for recovery in addition to the actual steps to be taken in response to disaster for a particular library or archive.

1. Kinds of Collections

Much of the planning will depend upon the collections themselves. Are they rare or unique materials valuable as artifacts as well as scholarly resources? Are they circulating collections whose primary value is for research, education, information, or entertainment? Is there a mix which must be considered? Can they be replaced? What are the copyright restrictions? E.g., can you copy materials without violating any restrictions on the use of the material? The answers to these questions will help in setting priorities for response, in the choice of appropriate techniques or services after a disaster, and in making the most cost-effective decisions.

2. Alternatives for Recovering Circulating Collections

Collections may be dried, cleaned, and, if necessary, fumigated. But are these the best choices given the kinds of collections? Other alternatives for circulating materials include the five listed below.

a. Discard, especially those items no longer needed, or most badly damaged. Sorting may occur at any time in the recovery process.

b. Replace with reprints, other copies, or items supplied by gift from other libraries or by vendors.

c. Replace with microfilm/fiche bought from other libraries or business, filmed by the library or archive itself, or through contracting with an outside business.

d. Replace with photocopies on good quality paper.

e. Rebind using a commercial library binder, especially where smoke- damaged edges can be trimmed and new cases constructed.

3. Alternatives for Recovering Rare or Special Collections

Rare and historical materials require a different approach, since they are valuable as unique items as well as for their research importance. Individual care and attention from experts such as curators and conservators will assist in the best recovery possible. Somewhat different alternatives must be considered for rare or special materials.

a. Restore items using the services of a conservator.

b. House in protective enclosures after basic recovery work is accomplished, or until funds are found for restoration.

c. Accept some disfigurement.

d. Copy the information on microfilm or photocopy as a last resort, and save the original in an enclosure.

e. Discard, only if salvage of the whole is threatened by too much attention to the individual, or if the artifact is truly damaged beyond the abilities of a conservator to restore it. Make the decision based on rarity, value, and the need for the object to be a part of the local or national collection rather than its informational value.

Discussion of these issues is a necessary part of the planning process. When the decisions are made, they will provide the basis for specific instructions for each individual library or archive to help guide any recovery effort.

B. Disaster Response

Appropriate immediate response to disaster can make the difference between severe loss and successful salvage. If wet materials are allowed to sit until planning and organization can take place , a great deal of damage will result. After seventy two hours mold may start to grow. Books will continue to swell grotesquely until they are no longer salvageable. Film emulsion will blister and lift from support surfaces. The better the recovery effort is organized in advance, the better chance there is of saving material, reducing damage, and cutting costs.

The steps outlined below are compiled from many experts who have been associated with disaster recovery. They form a pattern of reaction for any water or fire disaster. Ideally, all steps will be utilized. Realistically, it may not be possible, or steps may be overlooked in the rush of response. A particular situation may call for a very different order. But if response steps are written down and readily available, they will be a valuable asset in the initial recovery process. The steps are detailed so they are useful for a major disaster, but they can be used as a guide for responding to lesser emergencies.

1. Assess the Disaster Situation

Do not make hasty decisions. Get input from experts on the scene such as fire chiefs or building engineers. Give information and advice concisely to assist them in knowing your priorities and concerns. If the building is safe to enter, make a quick walk-through to determine the level of disaster response required. Do not spend time at this initial assessment looking at individual collections or items unless the disaster is minor. Put the steps of your plan into motion including calling out the disaster team and informing library/archive administration. Inform insurance or risk managers.

If the building is unsafe to enter, ascertain when you might be allowed inside. Decide when to call in the disaster team. Inform the administration. Take this time to plan for what appears will be required when access is permitted.

2. Convene the Experts

Experts may include the disaster team, collection experts, administration and risk managers. Give them all the information you have. Organize a detailed assessment of damage. As soon as possible, move into the collections to determine the extent of damage and the kinds of services, advice, and supplies which will be required. Assign someone the responsibility of documenting damage, including photographs.

3. Set Up a Command Post

Coordinate activity, and disseminate information to the press and the public. Set this center up away from the areas where staff and volunteers will be working. Others have found that a separate center away from directors' offices and the head of the disaster recovery effort is best. News stories will assist if volunteers, supplies, and services are needed. Later, good news coverage will help with fund-raising if that becomes necessary.

4. Activate Plans for Supplies and Staff

Once damage is known, or in some extreme cases only estimated, put plans into effect to obtain the necessary supplies and equipment. Assign the task, to a pre-determined individual or team, of making phone calls and placing orders. Inform the disaster team about the situation and assign them tasks. Set into motion plans for obtaining additional staff and/or volunteers if they are required.

5. Eliminate Hazards

Be sure that hazards are eliminated for staff and volunteers to work in the facility. Electricity may need to be turned off, mud and debris cleared from aisles and stairs, water drained or pumped out, portable generators and lights installed. Hazardous areas should be roped off to prevent the curious from entering or hurting themselves.

6. Control the Environment

Stabilize and monitor the environment, controlling temperature and humidity, in order to reduce biological, physical and chemical reaction. Mold will grow within seventy two hours if the temperature is above 24 degrees C. and the relative humidity is over 65 percent. Arrange for removal of carpets, furniture, and equipment, if necessary. Keep monitoring temperatures and humidity to be sure you are effecting the needed changes. Open or break windows if necessary to reduce temperatures or humidity. Turn off all heat, and turn on the air-conditioning system to cool off the building, if that is possible. Keep the air circulating in all areas of the building.

Arrange for protection of undamaged collections by covering ranges with plastic, or boarding up missing windows or roofs if weather and conditions require. If necessary have water pumped out of basements. Make provisions for security.

7. Initiate Recovery Plans

Put the pre-determined recovery plans into motion. Contact the managers of the outside facilities and services required so they can plan for the reception of materials. These services might include freezers, warehouses, conservation workshops, and film processing centers. Organize the removal of materials depending upon their damage and your priorities. Leave undamaged and protected materials until the last, for they might not require moving. Do not make decisions on the spot about discard, because badly damaged materials can often be salvaged. The exception would be material destroyed by fire. If much material is under water and all cannot be attended to immediately, leave it under water. Mold requires oxygen to grow, and paper will not swell badly until it is exposed to air. (However, glues may dissolve and water-soluble inks or dyes may wash out.)

8. Activate Staff

Allow the disaster team, staff, and/or teams of volunteers to enter the library or archives after careful instructions and training. Provide them with the supplies required and good supervision. The training, if necessary, and the supervision are coordinated by the leader of the disaster recovery team and provided by its members. If volunteers are required, be sure the library insurance coverage will permit them on the premises.

9. Document Activity

Document all activities carefully. Good record-keeping will assist with careful coordination and planning while the recovery effort continues. It will also give insurance companies a clear picture of the damage. Keep accurate and careful accounts of all materials during packing and removal, number boxes, tabulate quantities, note classification ranges to include in reports and replacement considerations. Blank pads of paper and pencils should be kept with the supplies stock for this purpose.

10. Provide Services

Disaster recovery is difficult and tiring work. People are often hot, wet, and under stress. Encourage frequent breaks, provide food, and toilet facilities. If necessary give advice on correct ways to lift heavy materials. Arrange for staff to rotate jobs to lessen fatigue and boredom.

11. Supervise

Supervise carefully and constantly, watching for difficulties which might cause delays. Follow the recovery plan. Be prepared to make adjustments in labor and techniques as recovery progresses. Assess progress and ideas objectively and ask for advice from other experts if certain aspects of recovery are unsuccessful or causing difficulties. If the disaster is a large one, organize the recovery effort with team leaders reporting frequently to the head of the recovery. It often helps to have one or more people circulating to watch for work backups and to help solve problems.

12. Communicate

It is important to communicate often about the progress with the staff not involved in the effort, and with the public. This can be done with regular communiques from the disaster site. Report regularly to administration. Document all efforts. Continue to take photographs. In a massive disaster, morale and productivity will drop after a day or two. Communication helps to overcome some problems by keeping people informed, by noting progress, by expressing appreciation.

13. Organize Recovery

After the response to save materials is initiated, consult the recovery phase of the disaster plan and organize the recovery effort. Clean the facility and fumigate if necessary. If fumigation is required, get the advice of experienced chemists or conservation research scientists. Most fumigants are toxic to humans and must be used with extreme care and only by professionals. Sunshine can be used to inhibit mold if nothing else is available. Be aware, however, that exposure to sunlight will darken acidic paper and cause colors to fade. Be sure there is appropriate shelving or storage for materials after they are rehabilitated and returned to the library or archives.

Look at the priorities for the collections in the disaster plan before choices are made on the appropriate recovery methods. Consider the successful experience of others while planning workflow, personnel, and the resources required for recovery.

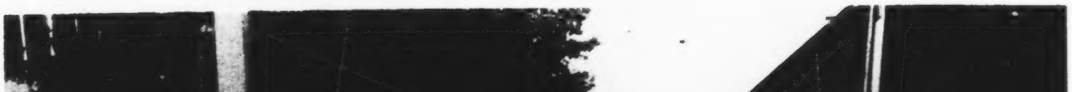
14. Conclude Response

When the response phase is completed, be sure all involved are thanked sincerely and appropriately. Write a detailed report documenting the results of the effort. Use all the statistics gathered so authorities understand thoroughly what has been accomplished and where the effort currently stands. Recommend the appropriate techniques and methods for the recovery phase; include costs and staffing requirements. If possible, suggest recovery alternatives based on collection priorities.

These ideas culled from the experience of others should assist in planning for response. Select and adapt those which apply to your organization while adding others which will make the plan you are writing practical and applicable to your collections. Think in terms of the plan being used by the least knowledgeable person on the staff so you include all the details and considerations necessary.

The specifics of carrying out recovery for collections will be discussed in Chapters Five and Six.

Top and Bottom Photos: Wet books packed in cartons and crates, loaded on pallets awaiting removal to a freezer. Courtesy of Stanford University Libraries and Peter Waters, Library of Congress.



CHAPTER FIVE - DISASTER RECOVERY, WATER

Most major disasters to libraries and archives involve water. If the primary effect of the disaster itself is not water damage, the secondary effect of an event such as an earthquake will cause water damage from broken pipes or collapsed roofs. It is clear that knowing how to recover from water damage is a major responsibility in disaster recovery. The recovery methods and techniques discussed in this chapter have resulted from a great deal of experimentation and use over the past two decades. Although there may be equally good alternatives, these recommendations have proven to be successful in a number of recovery efforts in several countries.

A. Action for Water Damage

If there is one clear rule for response to water damage it is this:

the faster the correct action, the better the result.

The key word is "correct." Once wet, paper and film emulsion will swell, bindings distort, leather and vellum react. The quicker they can be brought under control, the less disastrous your emergency will be. While efforts are underway to control the environment, which continues to affect the wet materials, immediate action is needed to reduce the final impact. Once the proper steps have been taken to remove and stabilize wet collections, decisions can be made about the appropriate recovery methods to be used. If the emergency involved only a few items, the following steps can usually be skipped and an immediate decision made about the recovery technique.

The advice given about recovery in this chapter and Chapter Six are the currently preferred techniques for the best results. However, this is not an ideal world, nor will everyone have access to all the technologies discussed. The principles of recovery should be understood, so planning can include reliable and sensible alternatives designed for a particular location or institution. If freezers, ice plants, dry ice, or freezing outdoor temperatures are not available to stabilize wet materials (see Section 3), then planners must obviously take this into consideration and include advice on what can be done. If air-drying is the only choice available, then care should be taken that it is the best air-drying, under the best conditions, which can be provided. Talking with those who have managed air-drying or other techniques should offer helpful suggestions and ideas. Do the best that is possible under the circumstances you must deal with, but do it as quickly as possible.

The guidelines listed below assume that the source of water has been identified and dealt with, all hazards removed, and utilities turned off if they are unsafe. Efforts have been undertaken to control the environment by reducing temperatures and humidity and by keeping air circulating. Supplies have been ordered and outside services contacted. Response teams have been instructed. The time has come to handle the materials.

Different media require different approaches and should not be packed or handled in the same way, nor placed in the same box if sound recovery is expected. It is always better to err on the side of caution than to regret a poor decision. If there is doubt about whether something in a water disaster area is wet, assume that it is.

One axiom should always be remembered:

> **All wet materials are extremely fragile and must be handled with care.**

1. Immediate Priorities

a. Check the disaster plan for your **high priority** collections.

b. Remove the **wettest material** first, followed by less wet, and then damp.

c. Remember that **film-based and magnetic media** deteriorate rapidly and should be attended to as soon as possible, if salvage is desired.

d. Be aware that **coated paper** (shiny surface) adheres quickly and may not be salvageable if left to dry more than a few hours without attention.

e. Attend to **leather, vellum, and parchment** as they require special handling if they are to be salvaged. If collections contain such materials, get advice from a conservator, and check resources listed in the appendices ahead of time to be prepared.

f. Stabilize items with **water-soluble media** to avoid loss or feathering of inks. Ask a conservator ahead of time what should be done, if freezing is not possible.

2. Handling and Removal

Correct handling and removal of all affected materials are critical for the best results. Staff must be trained in appropriate techniques, and must understand the extreme fragility of the items they are handling. Wet books jammed incorrectly in boxes will dry distorted. Items dropped will be permanently damaged. Torn pages can result in unnecessary additional repair costs. In planning the recovery section, the committee or planner should include precautions and make provisions for staff training. The recommendations listed below result from a great deal of field experience.

a. Handling

Distorted volumes should not be forced back into shape. But gentle shaping may be done if time allows and sensitivity is observed. The shape a book is in when it enters a vacuum chamber for drying is the shape it will be in after it is dry. If severe distortion can be prevented, recovery will be more successful. If covers are loose or pages separated, no attempt should be made to replace them on or in the book. All parts may be loosely wrapped and placed together in a box for future rehabilitation.

b. Removal

Material may be packed for removal from the facility wherever it is possible to work efficiently. Often this means having to take them out of the affected area before they can be packed. Lines of people and book trucks will assist in the effort. If elevators are not working, temporary slides or conveyor belts may be built down stairways to remove boxes, or pallets may be lifted out windows by construction cranes. Sometimes it is possible to work and pack in the affected stack area. Ideally as little handling as possible is best before material is packed and shipped out.

c. Documentation

Boxes should be numbered and important information recorded on them in waterproof ink. Careful records should be maintained separately about the numbers of items. Other pertinent information which might be needed such as classification ranges, the amount of damage, e.g., "slightly damp," or priorities can also be kept. Documentation should include the destination of materials if they are removed to other sites.

d. Cleaning

If material is covered with mud or debris, careful rinsing in clear water is permissible under supervision. Volumes should be held gently in two hands and dipped into containers of increasingly clean water. Stacks of manuscripts may be treated, carefully, the same way. Or very gently running water from a hose may also be employed. No material should be rinsed which has water-soluble components, and if there is any doubt, do not rinse. Material being rinsed should not be scrubbed or be opened to reach internal dirt.

If libraries and archives are located close to the ocean, disaster may result in salt water exposure. Although little experimentation has been carried out, it seems clear that rinsing materials carefully would reduce potential and severe damage. It may be carried out in the same way the rinsing of mud is handled.

Photographs may be rinsed very gently in shallow baths of clear, cool water. They must never be rubbed or scrubbed. After removal they may be laid out to dry in a cool, dry environment, or, less ideally, frozen for future drying. Color photographs are much more easily damaged and less likely to be recoverable. Slides may be treated like photographs, but may require removal from their mounts if silt has penetrated them. Advice from a reputable film processing company is recommended for both.

Microfilm and reel film may also be rinsed in clear, cool water. Ideally they should then be sent in containers of clear water to a reliable processing center for treatment. Black and white negative film can be submerged for up to three days before there is damage. Color film can be submerged for only two days. Microfilm and reel film have been frozen in some instances without damage. If there were no other choice, this alternative would be worth trying to avoid total loss. Reel film should never be allowed to dry rolled up.[12]

Reels of **magnetic tape** do not survive water exposure well. All vital records on this medium should be backed up and stored elsewhere. Floppy disks can be rinsed in cool, clear water, air-dried, placed in new jackets when dry, and recopied. But hard disks should never be placed after damage back into expensive equipment. Cassette cases are not removeable and the tape is almost always a total loss due to adhesion. The clear message is to prevent damage to these media.

e. Packing

Books should be packed spine down, in a single layer, in plastic crates or cardboard boxes. This prevents textblocks from dropping out, or bottom materials from being crushed by the weight of others on top. If time allows, every other book should be wrapped loosely in waxed or freezer paper to prevent sticking or transference of color or images to its neighbor. Wet materials are very heavy, so boxes should be sturdy and small enough to handle.

Documents should be packed in their folders, or in stacks, upright and one layer deep. No attempt should be made to separate them. An easy way to pack them is to turn the box on its side, packing material flat before standing the box and the documents upright.

Once packed and clearly marked, boxes may be stacked on pallets for easy removal to trucks by pallet movers. Or they may be stacked for removal by hand. In order to prevent further damage, cartons should never be placed directly on the floor or ground. Because boxes are wet, and materials are heavy, they should be stacked no more than three cartons high. It helps prevent damage to support the stack of boxes on the pallet by strapping, ropes, or plastic shrink wrap.

Large or unusually shaped items will require special packing to prevent damage to them. Any sturdy flat surface can be utilized for removing items from the disaster site, e.g., large pieces of flat cardboard, plywood covered in plastic, bakers trays, etc. Because folio-sized items may require very large boxes to pack them spine down, the decision may be made to box them flat. If so, they should not be placed more than two or three on top of one another, or the weight will destroy the bottom one.

If records or documents are stored in drawers, they may be carried out in those drawers for removal to air- drying facilities or for vacuum drying.

When all collections have been removed from the damaged area, and sent for stabilization to freezers or other protected areas for drying or storage, decisions can be made about the best recovery method, or methods, to employ. Statistics can be tabulated from the documentation for a clear understanding of the numbers and kinds of materials involved as well as the extent of damage.

3. Stabilization

Stabilizing wet materials as quickly as possible is essential for successful recovery. One of the safest ways to stabilize books, documents, photographs, textiles, and maps is to freeze them. All physical distortion, as well as all biological action, stops. The exception to this rule may be leather and vellum bound materials. Very little experimentation has been done on these classes of materials. If large numbers of leather or vellum bound books are involved in a disaster, there may be no other choice but freezing. Several conservators in small experiments have found that these items can be recovered as successfully after freezing and vacuum freeze-drying as after straight air-drying.

A caution mentioned previously should be repeated. If books are placed into a freezer greatly distorted, they are more difficult to rehabilitate after drying. So, care in packing will greatly assist the recovery effort.

Wet books and documents should be frozen as quickly as possible. Lower temperatures not only freeze items quicker, but also produce smaller ice crystals, which some conservators feel may reduce potential damage to the cellulose structure. There is mild disagreement about the ideal temperature. But anything below freezing is better than nothing. The best temperature is -20 to -30 degrees C .

Damaged material should be transported quickly to a freezer facility. If the disaster is a large one, several freezers may have to be utilized. If the distance is great, refrigerated trucks should be employed, or dry ice may be used in transport trucks. It is important to know that refrigerated trucks cannot actually freeze materials, but only chill them enough to prevent mold from developing, or keep already frozen materials from thawing. If your library or archive is located in a cold weather climate, materials can be placed outside for holding or freezing while transportation is arranged.

Freezers are used by a number of businesses including food storage, meat packers, shippers, ice producers, taxidermists, school cafeterias, ice cream manufacturers, and college and university research departments. If only a few items are involved, home freezers can also be employed.

Once in a freezer facility, care should be taken that pallets and cartons are stored properly to avoid further damage. If pallets are stacked, weight should not rest on those underneath.

If freezing or chilling in refrigeration is not possible,collections must be stabilized before drying by removing them from the disaster site to one where temperatures and humidity are as low as possible, and where the air can circulate freely. If materials have been moved to a new site in boxes, they should be removed immediately for drying. If this is not possible, all boxes should be opened to allow air circulation and superficial drying. However, the danger of mildew is high, and physical distortion will continue as long as books and documents are wet.

B. Techniques for Recovery

Over the years a great deal has been learned about recovering from water damage, and much experimentation has been undertaken both by private businesses as well as by conservation experts. The positive effect has been a number of possible techniques to employ depending upon damage, materials involved, and location of the disaster. Listed below are five techniques which have been successfully tested and employed for drying materials. The results will not be equally good. But they offer, no matter what the circumstances, the opportunity to recover from a water-related disaster. Drying methods should conform to the following general rules.

- **Stabilize collections as soon as possible.**
- **Provide as ideal an environment as possible under the circumstances.**
- **Avoid irreversibly damaging materials in the recovery process.**
- **Reduce the effects of the disaster on the materials.**
- **Prevent any future problems which might result from the disaster.**

Never hesitate to call upon the experts or institutions listed in the appendices to ask advice or assistance if there are questions or concerns. Rare or unique materials require special care and handling. It is important, as part of the disaster planning effort, to ask for instructions from conservators about specific material in your collections.

1. Air-drying

Air-drying is a technique which has been used for centuries to dry wet library and archival collections. It is an appropriate method if only a few books are involved, if material is only slightly damp, or if the use of better drying techniques is not possible or available. Because air-drying for large numbers of books is very labor-intensive, it is more costly than is at first apparent. If there are large numbers of books, and air-drying is the only alternative, the need for large drying space and staff can be reduced by freezing the books and drying a smaller amount at one time.

Maintaining good environmental control is important to avoid mildew and excessive swelling. Items should be dried in a low humidity environment with good air circulation. There is some debate about temperature. But, in general, because of the moisture in the materials, and the difficulty in reducing humidity, temperatures should be kept under 21 degrees C. (In cold climates, materials can be dried amazingly quickly outside in sub-freezing temperatures and low humidity, with a brisk wind blowing.) Keeping air circulating with fans, open windows, or blowers is critical for encouraging evaporation and discouraging dead air pockets where mildew will flourish. If relative humidity is over 60 percent, dehumidifiers will assist greatly in the effort.

a. Books are dried standing on end on absorbant paper, if available. Soft-covered or paperback books may require support if they are to stand upright while drying. If only damp, the pages can be fanned to encourage drying. If books are soaked, they must be allowed to drain and dry somewhat before they can be fanned and/or interleaved. As they drain, the wet paper underneath must be exchanged for dry paper. Books will dry more quickly if they are interleaved with clean, absorbant paper. It should be laid as far into the gutter margin as possible and extend beyond the top and fore edge. (Not the bottom edge, as the book needs to stand on that edge.) This encourages wicking of the moisture from the book, and evaporation from the absorbant paper. As the paper becomes saturated, especially early in the drying process, it should be exchanged for dry paper. At this point, the book should be stood on its opposite end to reduce sagging of the textblock. Interleaving should not be so excessive that it distorts the binding, and should probably be kept to about one third the size of the textblock. When books are dry to the touch they may be pressed to flatten them. (Books should never be pressed while still wet or even while damp.) This may be done with book presses, or between covered boards weighted with concrete blocks or bricks.

Books with coated paper do not respond well to air-drying. If this is the only alternative, they must be interleaved between almost every page, in spite of the distortion this may cause. They must also have their drying pages fanned carefully but frequently to lessen chances of adhesion.

Books may also be dried, if they are not too wet, hanging on lines strung close together to support their weight. This may help prevent distortion of the spine. This technique is especially good for pamphlets or smaller volumes.

b. Single-page manuscripts are best air-dried by laying them flat on clean absorbant paper. They may also be dried on lines, laid flat between two or three closely hung ones, or hung like clothes on a clothesline. The latter may only be done safely if the documents are no more than slightly damp, otherwise paper will tear. Some successful drying has been accomplished with single wet leaves adhered to polyester film,or sheer fabric, which has then been hung on a line with clothespins. As the leaf dries, it releases itself gradually. After drying, if necessary, paper manuscripts may be flattened by pressing gently between clean blotters in a book press or between covered boards weighted lightly. If there are many wet manuscripts stuck together, Peter Waters describes a technique for separating and drying them in his publication Procedures for Salvage of Water-Damaged Library Materials.[13]

c. Wet photographs should receive the care of a conservator if recovery is to be likely. Freezing will stabilize them until help can be obtained. But if this is not possible, photographs are best dried flat in single layers on clean, absorbant paper in a cool, low humidity environment with good air circulation. Mold grows quickly on prints, and emulsions will stick if they are stacked, so precautions must be taken. After drying, warping of the photographs should be expected due to the uneven drying of the paper base and the film itself.

d. Reel films should be sent to a processing center. If that is not possible, they should be unwound and air-dried strung on lines. They may still require cleaning or processing so they will not damage projectors when they are used.

e. Magnetic media may be cleaned, air-dried, and copied for reuse. These materials can withstand heat up to 200 degrees F. for up to an hour. In some cases hair driers have been used to assist in drying these materials. As stated earlier, cassettes and cartridges cannot be opened and reused, and will therefore probably be a total loss.

Mold growth is always a danger in air-drying. If it appears, no attempt should be made to rub or scrub it off books or paper. If cobweb-like growth appears, it may be brushed gently away. Once mold appears, fumigation will be necessary, and the services of a chemist or fumigation specialist should be sought. The casual use of thymol, ethylene oxide, ortho phenyl-phenol or more toxic chemicals is not encouraged for untrained personnel. If there are no other alternatives, for short periods of time, non-rare books and manuscripts may be exposed to ultra-violet light to discourage mold growth, although this may cause fading of inks or colors, or darkening of acidic paper. Freezing at temperatures of -20 degrees C or lower for at least forty eight hours has also been found useful to retard mold growth, although more experimentation remains to be done.

2. Freeze-drying

If it is safe to freeze them, many wet materials, including photographs, will dry slowly in the freezer. This is especially true of those which are not sodden. If the freezer has been adapted with the addition of finer controls for the purpose of drying library and archival materials, success at drying will be even greater. Material should be placed in the freezer, unwrapped, and exposed to the air as much as possible, preferably upon shelves or in plastic milk crates. The better the air circulation in the freezer, the better the drying time and results. However, photographs will lose surface gloss due to dirt and impurities being pulled to the surface. Consequently this method of drying should be not be undertaken for rare photographs unless better alternatives are not available. (See Appendix C for freezer equipment.)

3. Dehumidifying

A new way of drying library and archival materials is currently being tested and shows a great deal of promise. Dehumidification involves leaving the wet materials in place on the shelves and bringing enormous dehumidifiers on site. The relative humidity is lowered to the desired level, and the circulating and very dry air successfully evaporates the moisture. The temperature of the dry air may be either cool or warm. The technique has been used very successfully for dying out whole businesses after severe water damage. More experim^ntation must be carried out, but initial tests make this technique look promising for at least some kinds of library collections and materials. (See Appendix C for dehumidification services.)

4. Vacuum Drying (or Vacuum Thermal-drying)

Vacuum drying involves the use of a vacuum chamber. Materials may be placed in the chamber either wet or frozen, in boxes or on shelves. Air is removed from the chamber to create a vacuum, and heat is introduced to speed up the drying process. Materials dry effectively and fairly quickly depending upon the size of the chamber and the sophistication of its equipment. This is a very effective way to dry large numbers of wet books and documents. The results appear to be better than with air-drying. Because materials sit wet while they are drying, coated paper will often adhere, and distortion of textblocks will be observed. Inks or other water-soluble components may feather. Use of a vacuum chamber reduces the chances of mold growth which may be a problem with air-drying. If mold appears, upon expert advice, a fumigant can be introduced within the chamber as part of the process. Once dry, much silt and dirt may be brushed from the surface of materials.

Photographs, and other film-based media, should never be vacuum dried as they may stick together, and emulsions may separate from base materials. (See Appendix C for vacuum drying services.)

5. Vacuum Freeze-drying

Vacuum freeze-drying is at present the most successful way of drying large numbers of library or archival materials. Items are placed in the vacuum chamber frozen and never thaw as they dry. This is the important distinction between vacuum drying and vacuum freeze-drying. Air is removed from the chamber to create a vacuum, mild heat is introduced to speed up the process, and the ice crystals sublimate to water vapor, which is then drawn away from the materials. Bound materials distort less than they do in air-drying or vacuum drying, inks or other water-soluble materials do not in air-drying or vacuum drying, inks or other water-soluble materials do not feather any more than has already happened as a result of water damage. Coated papers respond well to vacuum freeze-drying as long as they were frozen before they started to adhere badly. Once again, it must be noted that vacuum drying or vacuum freeze-drying do not restore material. The shape items are in when placed in the chamber are the shape they will retain after being dried. The reduction of distortion in vacuum freeze-drying is especially true if books are restrained gently during the drying process. As with vacuum drying, a fumigant may be introduced upon expert advice, to retard mold growth if it is necessary. Vacuum freeze-drying also appears to pull dirt and silt to the surface much more effectively than does vacuum drying.

Although air-drying is the preferred method for drying photographic materials, if necessary because of large numbers, they may be vacuum freeze-dried, with the understanding that they will lose surface gloss. Therefore, only non-rare items or those in albums should be dried this way.

Magnetic tapes have also been vacuum freeze-dried in at least one disaster without loss of information. (See Appendix C for vacuum freeze-drying service.)

C. Rehabilitation of Dried Materials

Once materials are dry, the work of sorting, cleaning, repairing, binding, restoring, housing, and reshelving begins. This rehabilitation phase should be planned carefully to reduce costs and produce the most efficient result possible. Over the last decade a number of recovery efforts have revealed the following common challenges and considerations.

1. Estimates on personnel and budget requirements will be required. Set up a logical mechanism to provide these planning documents based on a flowchart for rehabilitation of the facility and the collections. A fund-raising effort may be necessary before recovery beyond freezing commences. Consider gifts as possible sources for replacement. Potential insurance claims will require accurate assessment and records.

Weigh the costs of replacing materials or reformatting them against drying, cleaning and/or binding. Consider replacement with purchased microfilm rather than reprints. Finally, the costs of recataloging new formats should be scrutinized.

2. While materials are in the freezer or are drying, rehabilitation of the building which houses them should continue. Cleaning and fumigation of contents as well as shelving and structure may be necessary. Windows and roofs may require replacing, and structural damage repaired. Environmental control systems, as well as smoke and fire protection equipment, may require servicing and repair.

3. Given the numbers of items and the damage done, staffing requirements for rehabilitation of the collections should be analyzed and requested.

4. Housing for returning collections should be decided upon, whether it is to be in the original facility or in storage. Extra shelving may be needed. Protective enclosures and supplies for cleaning and repair may be ordered.

5. Guidelines for judging the physical condition of dried materials and

for the sorting of returning materials should be developed. Routing procedures to the sorting area and from there to various locations for treatment or cleaning should be discussed and agreed upon. (See Appendix A. 5-10.)

6. Once a sample is dried, estimates can be made about the need for various outside services like commercial library binders or conservators.

7. Work areas for sorting and handling should be planned and set up so material can flow easily from delivery through the rehabilitation process and into shelving or storage. Care should be taken that no item is returned still damp. High priority should be placed on preventing an outbreak of mold. Even after drying, books and manuscripts appear to be more sensitive to mold infestation once they have been wet. Ideally, all items should be isolated from non-damaged collections for six months after drying, but this is often not possible. Periodic and thorough inspection should occur for this six months' period of time. Environmental conditions must be stabilized.

8. Material can be sorted into appropriate categories such as cleaning, repair and /or binding, and discarding. They can then be routed to the proper area for action. Production line labor is most efficient for gross sorting. As many of the treatment decisions as possible should be made at one handling. Collection experts may be required for assistance with decisions involving potential discards or replacements. Even at this stage discarding is less expensive than cleaning and binding.

9. Staff will be trained how to clean materials properly. Those sorted for

library binders can be sent. Books, manuscripts, and photographs may be placed in new protective enclosures when needed. Rare items may be routed to a conservator either in-house or sent out for treatment, or placed in protective enclosures for later treatment.

Cleaning can often be accomplished on paper and bindings by using soft brushes to flick away dirt lifted to the surface by the drying action in vacuum chambers. Chemical rubber sponges may be used to wipe soot and smoke away. Proper techniques should be observed to avoid "scrubbing" dirt or smoke into the paper or bindings. Cleaning techniques should be taught by a conservator or someone experienced in disaster recovery.

10. Sorting can be done using personal computers to put materials in shelf order before reshelving. For large disasters, this can save enormous amounts of time if planned carefully.

11. Shelf preparation including identification markings, book pockets, and security tags may be required. Cataloging records may need changing or upgrading. If the card catalog has been lost, or many items destroyed, a new catalog, perhaps on-line, may require planning and funding.

12. A system for keeping accurate records of all materials in process and returning to the shelves will ensure smooth management.

13. Keeping communications flowing to the rest of the library or archives staff is still important. Report regularly to administration and to the users of the collections.

14. Constant assessment of the process should be part of the routine. This will assist in the final report and analysis of the disaster and recovery effort. Objective analysis of successes and failures will not only improve the disaster plan, but will assist others who may have to face the same situation. Amend the disaster plan.

15. Thank sincerely those who assisted directly in the disaster recovery effort, as well as those who were drawn into it as an added responsibility to their other duties.

The burden of recovering from a major disaster is awesome. It should be clear that prevention and protection are the wisest steps a library can take to eliminate or reduce the impact. The funds expended in those efforts will be well spent. Being well-prepared in case of disaster, knowing the proper response patterns and the correct recovery techniques, will assist in rehabilitating collections in the most effective way for the least cost.

Top Photo: Shelves of books at the Los Angeles Central Public Library exposed to high temperatures during a fire, 1986. Note greater charring on upper shelves. Courtesy of Michael Leonard, Los Angeles Public Library.

Bottom Photo: Closeup of charred books exposed to high temperatures but not flames in a fire, 1986. Courtesy of Sally Buchanan.

CHAPTER SIX - DISASTER RECOVERY, FIRE

The most devastating disaster which can befall a library or an archive is fire, because with fire also comes smoke, soot, and water. Everything possible should be done to prevent it. Preventive measures ranging from lightning rods to fire suppression systems to security alarms should be employed. The possibility of fire outside the facility should be reduced, if necessary, by clearing brush away , and providing for water hoses or water brigades to soak dry plantings and roofs. Many materials cannot be recovered from fire and its effects no matter how sophisticated the techniques or experienced the conservator. The advice in this chapter is given in the fervent hope that it will never have to be utilized.

The recommendations on response in Chapter Four are the same for fire disaster as for water emergencies. The advice on Planning and Immediate Response will not differ except that the extent of the damage and the recovery will be greater with fire. Not only will there be the obviously burned material, but also there will be extensive water damage as well. Planning will have to include recovery from both kinds of disasters.

The intensity of fire fueled by modern materials, and the rapidity with which the heat and gasses spread, endanger collections far from the origin of the fire. In addition to the charring of materials, heat will have caused other damage. Cellulose structure is affected by the high temperatures, and collections may be embrittled due to this reaction, even if not burned. Leather and vellum will shrink, and photographic emulsion will shrivel. Additionally, soot and smoke deposits will carry with them the materials which have been consumed including plastic residues which are impossible in most cases to remove.

Although these cautions are meant to convey the gravity of fire damage, it is still true that some materials can be salvaged from burned collections. Every effort should be made to recover at least those collections considered of cultural value or of the highest priority. But the job is costly, tedious, and challenging.

Because of safety concerns, entry to burned buildings will probably not be gained for some time after the fire is extinguished. Small fires may continue to flare up, and inspection for the physical strength of floors and walls will have to be completed. Defer to the expertise of the fire department. If concerns have been communicated to them well ahead of time, they will be aware of your priorities and time constraints.

The recommendations listed are ones which will ease fire recovery. They should be considered in conjunction with those for water recovery efforts.

A. Response to Fire

For immediate response to any disaster, the ideas and recommendations in Chapter Four, Section B will hold true and should be followed. The steps listed below convey additional information for fire disaster recovery.

1. The worst charring will be noticed on the higher shelves. Since time is of essence, salvage the least damaged materials from the highest priority collections first. Then return to try to salvage the worst, or

salvage the least damaged from the next highest priority, and so forth.

2. Any material exposed to high temperatures should be assumed to be fragile. If it is wet, it will be even more so. Handling must be done with extreme care. Often extra support is necessary, and sturdy cardboard or polyester film can assist in supporting materials while the collections are moved to the freezer or to dry storage.

3. If material is wet as well as burned, stabilizing it by freezing will allow planning in a calm and objective way. For collections which are burned but not wet, packing and removal to another site or to storage must be carried out carefully to avoid further damage. However, it is important to be sure that damaged collections are totally dry before they are packed, so that mold will not develop. If in doubt, and if possible, allow them to air dry in a stable environment for a week before packing. Burned material may be housed in protective enclosures and rehabilitated or copied to another format later when funding and/or expertise is available.

4. Careful consideration should be given to replacing collections exposed to fire rather than rehabilitating them. Not only is the cost of recovery high, but once burned or exposed to extremely high temperatures, books and manuscripts will never be the same, nor are they restorable to their pre-fire state. Reformatting by purchase of microfilm or by filming or photocopying, purchase of reprints,

acceptance of gifts, and purchase of new editions are all good alternatives.

5. Collections protected by boxes and folders, and bound volumes firmly shelved, will resist some heat and fire, sometimes surprisingly well. Plastic and paper book jackets will ward off smoke and soot. All items should be inspected carefully before discard and replacement are considered. Often charred edges can be trimmed and covers replaced by library binders. Smoke odor can be eliminated by chemical treatment in vacuum chambers. Smoke and soot on the surfaces of materials can be reduced by the use of chemical sponges which retain the residue instead of smearing it around.

6. Rare and special collections should be protected at all costs against fire. Once exposed to fire or smoke and heat, they not only will be damaged, but also will lose value. All rooms and vaults housing such material should have fire suppression systems, preferably Halon or other gas. Further protecting them with boxes and other enclosures is also important. In planning to protect these collections, discuss preparedness with conservators for the best prevention as well as reliable response techniques.

B. Techniques for Recovery

Recovery techniques for fire and water damaged collections are much the same as they are for water damaged ones. But fire damaged materials require greater care in handling. If piles of valuable material are charred or stuck together, the services of a book or paper conservator will be necessary to retrieve even some of them. But minimally burned and wet collections may be dried following the suggestions in Chapter Five, Section D if they are significant enough to be retained. Rare materials will require the experience of a conservator to salvage.

C. Rehabilitation of Burned and Dried Material

The recovery of burned collections is difficult, as has been emphasized. The procedures for processing and cleaning the ones which are salvageable should follow those given in Chapter Five, Section E. Any restoration other than basic cleaning, rebinding, and rehousing is best left to a conservator. Fragile paper can be reinforced by Japanese paper or supported by encapsulation. Bindings can be replaced by a commercial library binder or hand binder. But the costs are prohibitive and must be carefully weighed against alternatives mentioned in Chapter Four, Section A.2. Smoke odor may be removed, or at least reduced, by the use of chemicals in vacuum chambers. But the soot and grime created by fire is often difficult or impossible to remove.

It should be mentioned that collections which are aesthetically displeasing may be preferred for the time being to a lack of any library service. This is especially true for materials which are not rare but are important for educational or informational purposes. An elderly man recently remarked about a burned library where many books went back to the shelf, "Well, it may not look so good or smell so good, but I can still read it."

Burned materials which are part of circulating collections can be replaced, microfilmed, or photocopied if they are too badly damaged. Rare materials require different decisions. After a disaster, none seems ideal.

Recovering from a fire disaster is expensive and difficult. Prevention is the least costly alternative. Vigilance and sensitivity on the part of staff to potential problems and hazards are invaluable. The sad truth is that all cultural institutions are vulnerable to arsonists who appreciate the tragedy of fire in libraries and archives, and the attention it will receive. Whether institutions are large or small, wealthy or not,all collections hold irreplaceable material. And we are all the poorer for the loss of any of it.

Books wet and swollen after a flood tumbled them on shelves and onto the floor, Stanford University, 1978. Courtesy of Stanford University News and Publication Services.

CHAPTER SEVEN - DISASTER RECOVERY, OTHER

The disasters addressed in this chapter are much less likely to occur, but no one can afford to be naive about the potential. If they do strike, they are apt to be in the catastrophic category where people, entire collections, and perhaps whole geographic areas as well are affected. In "Information and Records Management," Maedke, Robek and Brown look at disasters in terms of how they affect the institution involved.[14] I.e., for a library or an archive a major disaster might be one where all means of access to the damaged collections are also wiped out. An exercise similar to the one they describe would be a useful one to employ in general disaster planning for libraries and archives, but especially in catastrophic disaster planning. It could expedite the setting of priorities to a considerable extent. Often very little can be done to prevent catastrophes. They may involve explosion, armed conflict, weather, or contamination by chemicals. Some time should be spent during the disaster planning meetings discussing the potential for such an event. As with all such planning, collection priorities should be established so when salvage is possible, time will not be lost on making those decisions. In the case of catastrophic disaster, however, priorities may have to include consideration of many buildings housing extensive collections. If the institution for which the planning is undertaken could be in jeopardy, the decision must be made whether to move the treasures of the collection to another and safer site. Plans should be developed based on the likelihood that a whole region may be a disaster area, due to flooding, earthquake, armed conflict, etc., where facilities and services would not be available to the library or archive for immediate recovery. Planners should weigh the potential for such an event, and if it seems very unlikely, details may be kept to a minimum.

In 1958 UNESCO published a document titled "The Hague Convention for the Protection of Cultural Property" which may prove useful to cultural institutions considering the potential of armed conflict.

Much of the advice given in Chapter Four is solid for considering other kinds of disaster response and recovery. In addition, the following points should be considered.

1. If chemical contamination is possible, general advice on the kinds of chemicals likely to be found in a library or archival building, and how to deal with them, should be included. Experts should be identified to assist with any chemical spills. Staff need to be advised on how to react properly, especially if the library is located in a building where such an event could occur, e.g., a chemical laboratory or facility.

2. Sewage contamination may be a problem for areas where flash flooding or poor drainage could result in disaster. Civil defense personnel as well as world health organizations are sources for information in planning. Contaminated collections must be handled with gloves, protective clothing, and the proper masks to avoid health risks. Contaminants can be rinsed in much the same way as mud and silt are washed off as described in Chapter Four. But collections may require fumigation before they can be handled safely.

3. In case of potential armed conflict, plans should be developed for the

protection of vital records as well as national cultural treasures. This could include directions on removal of collections and how they are to be packed and sent to other sites.

4. The plans for the safety of people should give directions for how to deal with bomb or explosion threat. But such planning should also be included in collections emergency protection. Once priorities for keeping the library or archive functioning and serving its users are understood, plans can be made to protect those resources properly from potential atrocities such as explosions. Clearly a national treasure should not be exhibited unprotected in a public area, or rare materials placed underneath steam pipes in a basement storage area.

Planning for catastrophic events need not be detailed or difficult. It should, however, be considered seriously and included in every sound disaster plan, if only to acknowledge that thought was given to the topic and appropriate precautions taken.

CONCLUSION

The purpose of this manual is to develop a sense of urgency for careful disaster planning, and to encourage disaster preparedness for libraries and archives. In particular the guidelines examine techniques and methods for response and recovery from fire and water emergencies to books and manuscripts. Enlightened stewardship for collections implies sensible and cost-effective planning for their preservation. Since the fire at Alexandria and before, the history of disaster in cultural institutions makes it abundantly clear that the world's collections are sadly vulnerable to water and fire.

Many experts have contributed to the literature in the field, adding valuable insights for timely response and sound recovery techniques. Businesses and services have sprung up to answer the need for better drying technologies. Conservators have added their observations and research about the reaction of bound materials,paper and film to adverse conditions.

Recovery from disaster is now more possible than ever before. But the costs are sobering, and the decisions which must be made are often difficult and less than ideal. The importance of disaster preparedness cannot be overstated. Sound and enlightened prevention and protection can often prevent major disaster from striking. At the very least, significant loss can be reduced and a major disaster turned into a more moderate one.

The manual divides disaster **planning** into four main topics:

prevention, protection, response, and recovery.

Recommendations, many of them tested many times in the field, have been made for each topic to ensure the completion of a detailed disaster plan which will address the challenges of being prepared. Suggestions have also been made for ways in which prevention can be handled, proper response assured, and recovery carried out.

The advice in this manual is based upon the following general guidelines which can be employed by all librarians or archivists, under any local conditions.

1. **Accept responsibility for planning.**
2. **Plan in advance.**
3. **Use common sense.**
4. **Educate yourself and others about disaster planning.**
5. **Adapt advice to local situations when the ideal is not possible**
6. **React to a disaster quickly and in accordance with a plan.**

It is clear that institutions differ in their needs for prevention and protection, and in their abilities to call upon resources and services in response to a disaster. The point to be emphasized is that there is no one correct disaster plan or way of being prepared. Sensible, thoughtful planning and realistic preparedness will provide the best protection for collections.

The manual offers a broad scope of reliable approaches and solutions to disaster planning. However, there is still a great need for librarians, archivists, conservators and curators to share ideas and concerns while finding answers to disaster-related problems. New methods and techniques for recovery deserve testing and examination. Perhaps wider communication can serve as a means for improving disaster preparedness and recovery to assist in preserving the world's precious cultural heritage.

APPENDICES

The items in these appendices are examples of disaster planning documentation employed by a number of different institutions and individuals. All the following have given permission for their materials to be used as examples to encourage adaptation for local disaster preparedness contexts and needs. Permission should be sought before using or reproducing full texts.

- SOLINET - Southeastern Library Network, Inc.
- Los Angeles Central Public Library (LAPL)
- Stanford University Libraries (SUL)
- Sally A. Buchanan, Conservation Consultant

Appendix A: Sample Forms and Checklists

1. Internal and external hazard survey forms - Sally Buchanan
2. SOLINET disaster prevention checklist
3. SOLINET emergency preparedness form, supplies, equipment and services
4. SOLINET emergency preparedness form, in-house supplies
5. Guidelines to assist in judging results of book drying - Sally Buchanan for the Los Angeles Public Library (LAPL)
6. A checksheet for judging book quality after drying - Sally Buchanan for LAPL
7. A tally sheet to record results of judging book drying - Sally Buchanan for LAPL
8. Color-coded guidelines for book sorting after a disaster and/or drying Sally Buchanan for LAPL
9. A tally sheet to record statistics of color-coded book sorting- Sally Buchanan for LAPL
10. Two forms to be used in ascertaining priorities, locations, and information from libraries to include in a disaster plan - Stanford University Libraries
11. Sample floor layout, marked with priorities, to be included in a disaster plan

Appendix B: Expert Resources

1. Institutions which are available as resources for disaster planning and recovery
2. Experts who are available as resources for disaster planning and recovery

Appendix C: Services, Equipment and Supplies

1. A list of services and facilities available for disaster preparedness and recovery
2. SOLINET sources of preservation supplies and equipment

Appendix A.1

SAMPLE SURVEY - INTERNAL HAZARDS

Name________________________________ Date_______________________

(Check appropriate column)

	Acceptable Yes/No	Action Required	Completed
1. Ceilings			
2. Walls			
3. Windows/skylights			
4. Electrical systems			
sound			
adequate outlets			
multiple plugs			
5. Pipes and Plumbing			
joints			
valves			
drips			
6. Heating, ventilating and air-conditioning systems			
7. Fire detection equipment			
8. Fire suppression systems			
9. Water detection equipment			
10. Security alarms			
11. Trash			
12. Housekeeping			
13. Stack areas			
Shelving			
Exits			
Collections off floors			
14. Construction projects			

Other:

Comments:

Appendix A.1.1

SAMPLE SURVEY - EXTERNAL HAZARDS

Name________________________________ Date______________________

(Check appropriate column)

	Acceptable Yes/No	Action Required	Completed
1. Building			
2. Roof			
3. Drainpipes/gutters			
4. Windows/skylights			
5. Trees			
6. Landscaping:			
planters			
garden beds			
other			
7. Water hazards:			
irrigation			
fountain			
fire hydrant			
natural drainage			
other			
8. Fire hazards:			
brush			
outside fire protection			
location			
other			

Other:

Comments:

SOLINET

Southeastern Library Network, Inc.
Plaza Level, 400 Colony Square
1201 Peachtree Street, N.E.
Atlanta, Georgia 30361
Telephone (404) 892-0943

STRATEGIES FOR EMERGENCY PREPAREDNESS:
Disaster Prevention Checklist

SOLINET Preservation Program
March 1986

Roof condition and flashings -- leaks? cracks?

Eaves, gutters, drains -- condition? cleaned regularly?

Walls -- leakage/seepage? noxious paint?

Floors/ceilings -- air passages between floors?
concealed spaces?

Windows and skylights -- caulking sound? trees trimmed?

Pipes and plumbing (especially joints & valves) -- location?
well supported?
leaks?

Heating, ventilation, air-conditioning (HVAC) system:

- furnace -- checked regularly? fire-resistant enclosure?
- air conditioning -- leaks? dehumidification? mold present?
- ventilation -- ability to exhaust?

Stack areas -- shelves braced?
books shelved tightly?
books shelved 6" off the floor?
stairways and pipe shafts enclosed?
valuable materials in basement?
exits unobstructed?

Fire safety

- annual fire marshall visit
- detection systems -- smoke and ionization?
  functioning properly?
- suppression systems -- tested regularly?
  staff trained?
  locations?

Water protection -- present? functioning?
sump pumps and back-ups?

Wiring -- overloading? condition?

Housekeeping -- janitors' closets?
trash removal?
storage of cleaning supplies and other flammables?
smoking policies?

Staff training -- interpreting annunciator panels?
sounding alarms?
notifying fire department and other safety officers?
using extinguishers?
turning off power, a/c, sprinklers, gas?

Insurance -- policy up to date?
replacement costs specified for special materials?
new equipment added to policy?
what records required for claim?
duplicate shelflist?
"acts of God" covered?
federal disaster relief?

Security -- book drops outside building or in fire-resistant enclosure?
exterior lighting?
locks/alarms on windows and doors?
closing procedures?

Construction projects -- responsibility for enforcement of fire precautions clearly spelled out in contract?
fire guards used in all cutting and welding operations?
debris removed daily?
fire-resistant partitions used to separate building areas?
extra fire extinguishers on hand?

Prepared by Lisa L. Fox, SOLINET Preservation Program, with assistance from: Margaret Byrnes, "Disaster Planning," unpublished notes, 1984.

Appendix A. 3

SOLINET

Southeastern Library Network, Inc.
Plaza Level, 400 Colony Square
1201 Peachtree Street, N.E.
Atlanta, Georgia 30361
Telephone (404) 892-0943

STRATEGIES FOR EMERGENCY PREPAREDNESS
Typical Supplies, Equipment, & Services for Disaster Planning

SOLINET PRESERVATION PROGRAM
March 1986

A. Emergency Numbers

Type of Service	Firm/Contact Person(s)	Phone (Day/Night)
Ambulance Svc.		
Fire Department		
Hospital		
Police Dept.		
Security Dept.		
Sheriff		
(Other)______		

B. Resource People

Type of Service	Firm/Contact Person(s)	Phone (Day/Night)
Architect		
Carpenter		
Chemist		
Computer Engineer		
Conservation Consultants		
Conservator		
Electrician		
Insurance Agent		
Janitorial Svc.		
Legal Advisor		
Lock Smith		
Mycologist		
Pest Control		
Plumber		
Telephone Co.		
Utilities Co.		
(Other)______		

C. Equipment, Facilities, Services

Type of Service	Firm/Contact Person(s)	Phone (Day/Night)
Data recovery svc.		
Dehumidification svc.		
Dehumidifiers		
Fire restoration		
Fork lift		
Freeze-drying svc.		
Freezer space		
Fumigation		
Milk crates		
Pallets, wooden		
Space (for work, drying, storage)		
Trucking service		
Trucks, refrig.		
(Other)__________		

Prepared by Lisa L. Fox, SOLINET Preservation Program, with assistance from: Hilda Bohem, *Disaster Prevention and Disaster Preparedness,* 1978; Disaster Planning Committee, Clemson University, "Disaster Recovery Plan," 1984; Jeffrey Michael Duff, "Kentucky Records Disaster Response Plan," 1984; and The Preservation Committee, New York University Libraries, *Disaster Plan Workbook,* 1984.

Appendix A.4

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Southeastern Library Network, Inc.
Plaza Level, 400 Colony Square
1201 Peachtree Street, N.E.
Atlanta, Georgia 30361
Telephone (404) 892-0943

STRATEGIES FOR EMERGENCY PREPAREDNESS:
Typical Supplies for an In-House Stockpile

SOLINET Preservation Program
March 1986

ITEM	LOCATION	QUANTITY	DATE CHECKED
batteries			
book trucks			
boots			
brooms			
buckets			
cardboard cartons			
chemical light sticks			
cleaning compounds			
clothesline (30 lb.)			
clothes pins, plastic			
crowbar			
dehumidifiers			
disinfectant			
duct tape			
extension cords (3-wire, grounded, 50-ft.)			
fans			
first aid kits			
flashlights			
freezer paper			
generator, portable			
hammer and nails			
hand saw			
hoses, water			
hygrometers			
incandescent work lights			
labels, adhesive			
ladders			

In-House Supplies, continued

Item	Location	Quantity	Date Checked
mops			
p-slips			
paper towels			
pens/pencils			
plastic garbage bags			
plastic milk crates			
plastic sheeting			
plywood (asst. sizes)			
protective masks, gloves, clothing			
scissors			
shovel			
tape, packing			
toothpicks			
two-way radios			
unprinted newsprint			
water vacuums			
waxed paper			

Prepared by Lisa L. Fox, SOLINET Preservation Program, with assistance from:

Hilda Bohem, Disaster Prevention and Disaster Preparedness, 1978.
Disaster Planning Committee, Clemson University, "Disaster Recovery Plan," 1984.
Jeffrey Michael Duff, "Kentucky Records Disaster Response Plan," 1984.
The Preservation Committee, New York University Libraries, Disaster Plan Workbook, 1984.

Appendix A.5 Sally A. Buchanan, 1986

Guidelines for Judging Results and *Analyzing Needs*

Cloth and Covers

1. Is cloth or other cover material adherred to the boards and spine?
2. Is cloth or other cover material still strong and sturdy enough for use?
3. Is cloth or other cover material stained, smoky, muddy or otherwise unacceptable?
4. Are boards flat? Are they still attached firmly? Do they open and close?
5. Is spine intact?
6. Are the external joints and internal hinges sound?
7. Is the cataloging record or classification label still intact?
8. Is the security tag (if used) still intact?
9. Is the book pocket or tag for automated circulation (if used) still intact?
10. *Are further cleaning and repairs needed?*

Bindings

1. Is the textblock still sewn or glued firmly with no loose pages?
2. Are the endsheets solid?
3. Will the text open and close flat?
4. Is the binding structurally sound? *(If not, what is an acceptable rebinding procedure: commercial, repair,conservator, protective enclosure?)*

Textblock

1. Is the textblock completely dry?
2. Are there any signs of mold?
3. Are there any stuck pages?
4. Is the paper dirty or stained? smoky or sooty?
5. Are the pages badly cockled (wrinkled)?
6. Is the textblock swollen? *(If so, how much? If so, can it be used ?)*
7. Is the textblock distorted, out of "square"? *(If so, can it be used , rebound?)*
7. Are there inks which have run?
8. Is the illustrative material usable?
9. Is the condition of the textblock aesthetically pleasing? *(If not, is it acceptable For the use for which it is needed?)*
10. *Are further cleaning and repairs needed?*

General Guidelines and Questions to Keep in Mind:

1. *Is the condition of the material caused by the disaster, the drying, or was it already in poor shape?*
2. *What is the value of this item? What is its value as part of a collection? Is it rare or unique in any way?*
3. *Is the cost of further treatment and repair worth it?*
4. *If the material is aesthetically displeasing, could it still be used?*
5. *Is the material replaceable? If so, in what format, at what cost, and is that acceptable for the intended use?*
6. *While this material is being handled, are there any other decisions which ought to be made, i.e., recataloging, inserting security tags, weeding, etc.?*

Appendix A.6 Sally A. Buchanan, 1986

CHECKSHEET FOR JUDGING BOOK QUALITY AFTER DRYING

Name ______________________________ Date ______________________

Check appropriate category

	unacceptable (unusable)	requires preservation	acceptable as is
CASES (covers):			
1. cloth or covering material			
2. boards			
3. spines			
4. joints			
5. opens well			
6. closes flat			
7. distortion			
8. security tags, bar codes, pockets			
BINDINGS:			
1. sewing or glue strong			
2. pages held firmly			
3. endsheets solid			
TEXTBLOCK:			
1. dry			
2. mildew			
3. stuck pages			
4. distortion			
5. closes and opens well			
6. illustrations			
7. dirty or stained			
Number of checkmarks			

Appendix A.7 Sally A. Buchanan, 1986

TALLY SHEET FOR JUDGING BOOK QUALITY AFTER DRYING

Name ______________________________ Date_____________

	unacceptable (unusable)	requires preservation	acceptable as is
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

Total columns of checkmarks:

Appendix A.8 Sally A. Buchanan, 1986

Color-Coded Guidelines for Book Sorting After Disaster

GREEN

These books are to be boxed for storage with no further handling required:
1. covers, bindings, and text clean and in good repair -- able to be used as is
2. minimum warping or cockling of book, judged acceptable for use as is, no loose pages or binding

RED

These books require cleaning and/or repair before they could be used :
1. dirt or smoke on covers and/or text
2. paper of text and/ or cover material require repairs
3. books require new labels, bar codes, security tags, etc.

RED/BLUE

These books require cleaning or repair before being sent for rebinding:
1. dirt and/or smoke on covers and/or text
2. paper requires repair

BLUE

These books require rebinding or recasing before use (if textblock is usable):
1. covers moderately to badly warped or damaged
2. fabric covering is damaged or badly stained or mildewed
3. boards are loose or detached
4. spine loose or missing
5. inner or outer joints broken or too loose to repair.

YELLOW

These books are to be set aside for selector decisions if not a GREEN or RED:
1. books which fit the selectors' criteria
2. books published before 1850
3. books which appear to be special for some reason, e.g., fancy bindings, age, etc.
4. books with leather or vellum bindings

BLACK

These are books to be discarded because of the following problems:
1. Burned or severely smoke-damaged text
2. Textblock or pages adhered beyond release
3. Portions of text, pages, etc. missing
4. Severe mildew infestation

Appendix A.9 Sally A. Buchanan, 1986

LOS ANGELES PUB. LIB. DISASTER RECOVERY PROJECT

INITIALS____________________
DATE____________________ SHEET NO. __________

	GREEN return to shelves	RED repair and clean	RED/BLUE repair, clean and rebind	BLUE rebind	YELLOW set aside for selector	BLACK
TOTALS						

TOTAL THIS SHEET __________

Appendix A.10

SUL LIBRARY/DEPARTMENT SALVAGE PRIORITIES

Library/Department:________________________ Date:________________

Head/Chief:______________________________ Location:____________

Briefly describe parts of the collections which should have top priority in salvage operations in the event of a disaster/emergency which may be potentially damaging to all or large parts of the library/department. Include any top priority parts of the collection shelved in another location as well. If an index or catalog of a collection is itself top priority, be sure to indicate it on this form.

COLLECTION	LOCATION	TYPE OF MATERIAL	AMOUNT	CONSULTANT
List in order of priority and describe briefly	Building, room, level, range, etc.	Books, manuscripts, maps, film, etc.	Vols.,boxes shelves, etc.	Staff able to advise about collections

1.

2.

3.

4.

5.

Appendix A.10.1

SUL LIBRARY/DEPARTMENT DESCRIPTION

Library/Department: Date:________________

Building:

Location:

Rooms:

Protection:

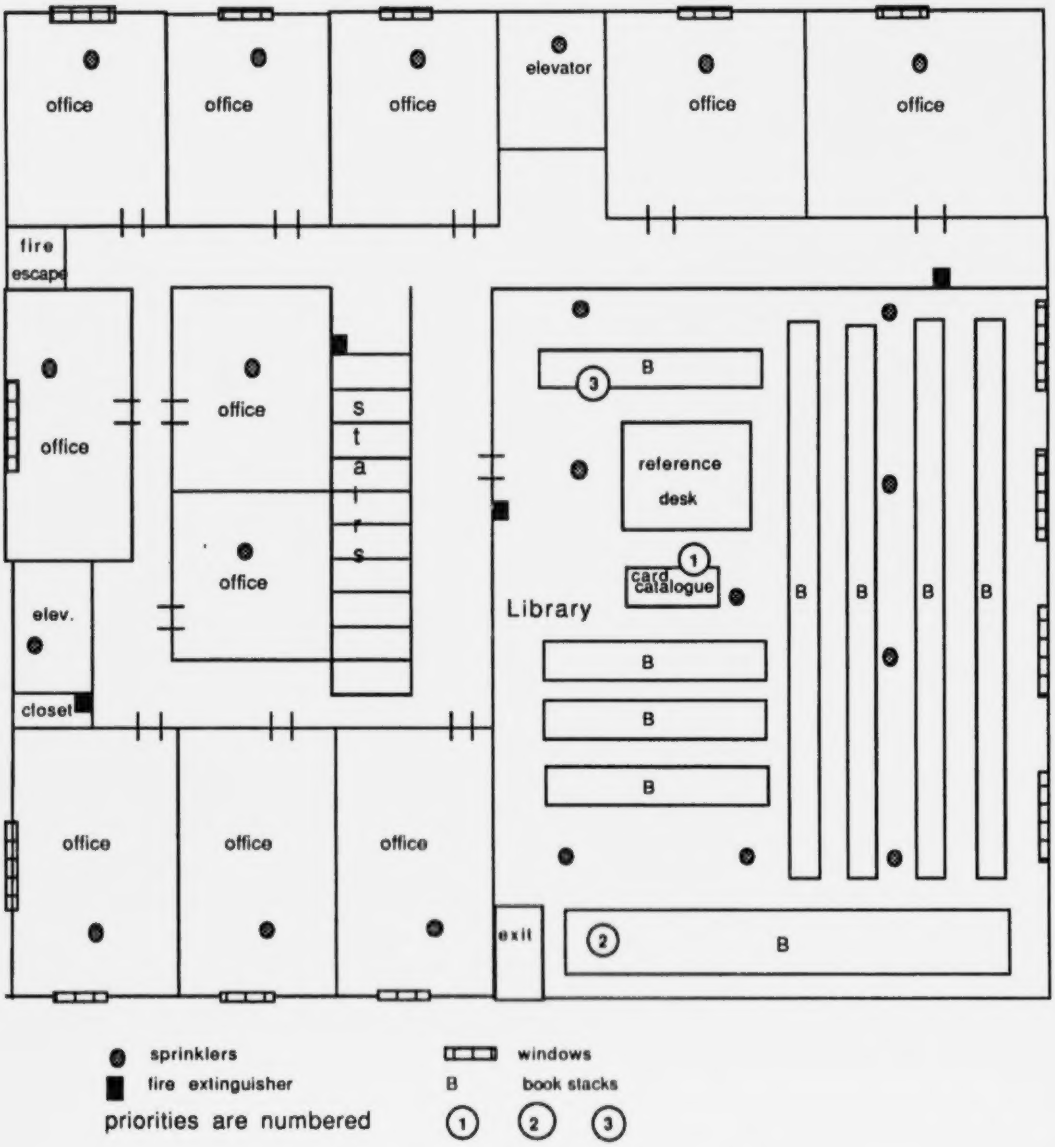
Access:

Points of Interest/Problems:

Appendix A.11 Sally A. Buchanan

SAMPLE FLOOR LAYOUT FOR A DISASTER PLAN

Academic Building A 3rd Floor Library and Offices


office
office
office
elevator
office
office
fire escape
office
office
s t a i r s
office
elev.
closet
office
office
office
B
reference desk
card catalogue
Library
B
B
B
B
B
B
B
B
B
exit
B
sprinklers
fire extinguisher
priorities are numbered
① ② ③
windows
B book stacks

Appendix B

RESOURCES

The following experts and institutions have given permission for their names to be included as resources for advice and assistance in case of disaster. Their generosity is gratefully acknowledged, and should be respected.

Disaster advice may be obtained from conservation departments in major libraries and museums in many parts of the world. In addition, private conservators often have expertise in this area of conservation. Finally, professional conservation, library, and archival associations may be able to refer inquiries about disaster assistance to professionals with expertise in disaster recovery.

The Library of Congress National Preservation Program Office
The Library of Congress
Madison Building
Washington, D.C. 20540

Ms. Merrily Smith - Conservator and National Preservation Program Specialist
Mr. Peter Waters - Conservator and Conservation Officer

The National Library of Australia
Canberra ACT 2600,
Australia

Dr. Jan Lyall - Director, Preservation Services Branch

PróMemória
Programa Nacional de Preservação da Documentação Historica
Rua Pacheco Leao 2040
Horto, Rio de Janeiro, RJ
Brazil 20001 cep

Laboratorio de Restuaração de Livros e Documentos
Ministerio de Justica
Setor Grafico
Brasilia, D.F.
Brazil cep 70.000

Fundação Joaquim Nabuco
Nucleo de Restauração
Rua 17 de Agosto 2187
Casa Forte, Recife
Pernambuco
Brazil cep 50.000

Ms. Sally A. Buchanan, Conservation Consultant
690 Greer Rd.
Palo Alto, CA. 94303
USA

Mr. Don Etherington, Conservator and Chief Conservation Officer
Harry Ransom Humanities Research Center
Box 7219
University of Texas
Austin, Texas, 78713
USA

Mr. Barclay Ogden, Conservation Administrator and Head
Conservation Department
Doe Library
University of California, Berkeley
Berkeley, CA 94720
USA

Ms. Linda Ogden, Conservator of Rare Books
1205 Josephine Street
Berkeley, CA. 94703
USA

Mr. Anton Rajer, Conservator
Center for Conservation and Technical Studies
Harvard University Art Museums
32 Quincy Street
Cambridge, MA. 02138
USA

Dr. Colin Pearson, Principal Lecturer, Conservation
Canberra College of Advanced Education
PO Box 1
Belconnen ACT 2606
Australia

Mr. Jeavons Baillie, Paper Conservator
National Library of New Zealand
Conservation Unit
Private Bag
Wellington,
New Zealand

Appendix C

RESOURCES - SERVICES, FACILITIES

The following businesses are able to offer a variety of services and facilities to assist with disaster preparedness and recovery. This partial list is not an exhaustive one nor does it constitute an endorsement, but rather offers opportunity to pursue questions and to discuss concerns for disaster planning. In addition, there are many other private businesses whose services are not designed exclusively for conservation and disaster assistance, but are often willing to discuss conservation applications or assistance.

Freeze-Drying Equipment

Northstar Freeze Dry Manufacturing
PO Box 439
Pequot Lakes, MN 56472 USA

Wei T'o Associates, Inc.
PO Drawer 40
21750 Main Stret, Unit 27
Matteson, IL 60443 USA

Dehumidification Services

Airdex Corporation (portable equipment)
2100 West Loop South Suite 820
Houston, TX 77027 USA

Moisture Control Services (portable equipment)
216 New Boston Street
Woburn, MA 01801 USA

Vacuum-drying Services

American Freeze-Dry Inc.
411 White Horse Pike
Audubon, NJ 08106 USA

Blackmon-Mooring-Steamatic Catastrophe, Inc.
One Summit Ave., Suite 202
Fort Worth, TX 76102 USA
Consortium Conservation Ltd.
Victoria Dock
Dundee DDI 3HU Scotland

Document Reprocessors (Portable chambers)
55 Sutter Street Suite 120
San Francisco, CA 94103 USA

Mercer Freeze Dry
2865 Park Blvd.
Palo Alto, CA 94306 USA

Museum Services
434 South First St.
San Jose, CA 95113 USA

Vacuum Freeze-Drying Services

Document Reprocessors (portable chambers)
55 Sutter Street Suite 120
San Francisco, CA 94103 USA

Deodorizing, Cleaning Services

Aeroscopic Engineers, Inc.
6745 Denny Ave.
North Hollywood, CA 91606 USA

Museum Services (See vacuum-drying #5)

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Plaza Level, 400 Colony Square
1201 Peachtree Street, N.E.
Atlanta, Georgia 30361
Telephone (404) 892-0943

SOME SOURCES OF CONSERVATION/PRESERVATION SUPPLIES & EQUIPMENT

SOLINET PRESERVATION PROGRAM
Leaflet #2
September 1985

The following list includes companies that provide supplies, equipment, and (in a few cases) services that are appropriate to conservation and preservation activities. Each entry includes the company's name, mailing address, and (when available) phone number. In the right column is a brief indication of the product or products available through each company. Those listed as "general" suppliers carry a wide variety of supplies. Inclusion in this list does not imply SOLINET endorsement, nor does the omission of any supplier indicate censure. This leaflet will be revised from time to time, as additional suppliers are identified.

Abbeon Cal, Inc. 123 Gray Avenue Santa Barbara, CA 93101 805-966-0810	equipment
Absorene Manufacturing Co. 1609 North 14th Street Street. Louis, MO 63106 314-231-6355	surface cleaning materials
Aiko's Art Materials Import 714 North Wabash Chicago, IL 60611 312-943-0475	papers & supplies
American Freeze-Dry, Inc. 411 White Horse Pike Audubon, NJ 08106 609-546-0777	disaster recovery services

H.W. Andersen Products, Inc. 6034 Chester Avenue, Suite 101 Jacksonville, FL 32217 904-737-2444	fumigation equipment
Andrews/Nelson/Whitehead 31-10 48th Avenue Long Island, NY 11101 212-937-7100	paper & binding materials
Applied Science Laboratory 2216 Hull Street Richmond, VA 23224 804-231-9386	Barrow paper test kit
Art Handicrafts Co. 3512 Flatlands Avenue Brooklyn, NY 11234 212-252-6622	rivets
Bendix Corporation National Environment Instruments Division P. O. Box 520, Pilgrim Station Warwick, RI 02888	gas detector kits
Bookmakers 2025 Eye Street, NW, Room 307 Washington, DC 20006 202-296-6613	general
Bridgeport National Bindery, Inc. P. O. Box 289 104 Ramah Circle South Agawam, MA 01001 413-789-1981	phase boxes
Bill Cole Enterprises P. O. Box 60 Wallaston, MA 02170-0060	Mylar sheets & envelopes
Conservation Materials, Ltd. 340 Freeport Blvd Box 2884 Sparks, NV 89431 702-331-0582	photo housing & mounting
Conservation Resources International 8000 H. Forbes Place Springfield, VA 22151 703-321-7730	general photographic storage

Document Reprocessors 55 Sutter Street, Suite 120 San Francisco, CA 94103 415-362-1290	disaster recovery services
Dorlen Products 7424 West Layton Avenue Greenfield, WI 53220 414-232-4840	surface water detectors
E.I. DuPont de Nemours & Co., Inc. Fabrics & Finishes Dept. Industrial Products Division Wilmington, DE 19898	Mylar rolls
Durasol Drug & Chemical Co. 1 Oakland Street Amesbury, MA 01913	dry cleaning pads
Environmental Tectonics Corporation County Line Industrial Park Southhampton, PA 18966 1-800-523-6079	environmental monitoring equipment
Fire Equipment, Inc. 57 Hicks Avenue Medford, MA 02155 617-391-8050	fire extinguishers/detectors
Fisher Scientific Company 711 Forbes Avenue Pittsburgh, PA 15219 412-562-8300	environmental monitoring equipment
Franklin Distributors Corp. P. O. Box 320 Denville, NJ 07834	photographic storage
Gallard-Schlesinger 584 Mineola Ave. Carle Place Long Island, NY 11514 516-333-5600	sulphur dioxide test paper
Gane Bros. & Lane, Inc. 1400 Greenleaf Avenue Elk Grove Village, IL 60007 312-593-3360	book press
Gaylord Bros., Inc. Box 4901 Syracuse, NY 13221	general
Hamilton Industries 1316 18th Street Two Rivers, WI 54241	map cases

Hollinger Corporation P. O. Box 6185 3810 South Four Mile Run Drive Arlington, VA 22206 703-671-6600	general photographic storage
I.C.I America Inc. Plastics Division Wilmington, DE 19897	polyester sheets/rolls
Robert Jacobson: Design P. O. Box 8909 Moscow, Idaho 83843 208-882-3749	preservation education posters
The Kimac Company 478 Long Hill Road Guilford, CT 06437 203-453-4690	inert plastics
Light Impressions Corporation 439 Monroe Avenue P. O. Box 940 Rochester, NY 14603 800-828-6216	general photographic storage
Littlemore Scientific Engineering Co. Railway Lane, Littlemore Oxford, ENGLAND	ultraviolet light meter
McDonnell Aircraft Company Box 516 St. Louis, MO 63166 314-232-0232	disaster recovery services
William Minter 1948 West Addison Chicago, IL 60613 312-248-0624	ultrasonic welder for encapsulation
Moisture Control Services 216 New Boston Street Woburn, MA 01801 617-933-2180	disaster recovery services
Northstar Freeze Dry Manufacturing P. O. Box 439 Pequot Lakes, MN 56472 218-963-2900	freeze-dry chambers
Cole Palmer 7425 North Oak Park Avenue Chicago, IL 60648 312-647-0272	environmental monitoring equipment pH testing materials

Photofile 2000 Lewis Avenue P. O. Box 123 Zion, IL 60099	photographic storage
Pohlig Bros., Inc. P. O. Box 8069 Richmond, VA 23223	paper supplies
Printfile, Inc. Box 100 Schenectady, NY 12304	photographic storage
Process Materials Corporation 301 Veterans Boulevard Rutherford, NJ 07070 201-935-2900	general
Rohm & Haas, Plastics Division Independence Mall West Philadelphia, PA 19105	ultraviolet filtering sheets
Science Associates, Inc. Box 230, 230 Nassau Street Princeton, NJ 08540 609-924-4470	environmental monitoring equipment
Solar-Screen Company 53-11 105th Street Corona, NY 11368 212-592-8223	ultraviolet filtering materials
Solomat Corporation Glenbrook Industrial Park 652 Glenbrook Road Stamford, CT 06906 800-932-4500	environmental monitoring equipment
TALAS -- Technical Library Service 213 West 35th Street New York, NY 10001-1996 212-736-7744	general
Taylor Instrument Company Consumer Products Division Sybron Corporation Arden, NC 28704	environmental monitoring equipment
Arthur H. Thomas Co. P. O. Box 760 Philadelphia, PA 19105 215-574-4500	environmental monitoring equipment pH testing materials

3M Film & Allied Products Division 3M Center St. Paul, MN 55101	polyester sheets/rolls tape for encapsulation
Transilwrap Company 2615 North Paulina Street Chicago, IL 60614 212-594-3650	photographic storage
University Products P. O. Box 101 South Canal Street Holyoke, MA 01041 413-532-9431	general photographic storage
Vacudyne Altair 375 East Joe Orr Road Chicago Heights, IL 60411 312-757-5200	fumigation equipment
Verd-A-Ray Corporation 615 South Front Street Toledo, OH 43605 419-691-5751	fluorescent tubes, low UV
VL Service Lighting Bank Street, CN 4100 Hightstown, NJ 08520-9946 609-448-0700	lighting products
S.D. Warren Company 225 Franklin Street Boston, MA 02101	acid neutral & alkaline paper
Washi No Mise R.D. #2 Baltimore Pike Kennitt Square, PA 19348	paper supplies
Wei T'o Associates, Inc. P. O. Drawer 40 21750 Main Street, Unit 27 Matteson, IL 60443 312-747-6660	deacidification supplies & equipment book dryer/exterminator

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2. Elizabeth K. Gay, internal report, "Los Angeles Central Public Library Fire" (May 1986).

3. John Morris, The Library Disaster Preparedness Handbook. (Chicago: American Library Association, 1986), p. 30.

4. John Morris, Managing the Library Fire Risk, pp. 53-75

5. James Flink and Henrik Hoyer, "Conservation of Water-Damaged Written Documents by Freeze-Drying," Nature vol. 234 (December 17, 1971).

6. Elwood A. Willey, "The Charles Klein Law Library Fire", Fire Journal 66 (Nov. 1972): 16-22.

7. John H. Martin, ed., The Corning Flood: Museum Under Water. (Corning, N.Y.: Corning Museum of Glass, 1977).

8. Walter W. Stender and Evans Walker, "The National Personnel Records Center Fire: A Study in Disaster", American Archivist 37. (Oct. 1974): 521-49.

9. Toronto Star (Toronto, Ontario, Feb. 11, 12, 14, 1977).

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12. James M. Reilly, Care and Identification of 19th Century Prints (Rochester, N.Y.: Eastman Kodak Company, 1986) pp. 80-82.

13. Peter Waters, Procedures for Salvage of Water-Damaged Library Materials. 2nd ed., (Washington, D.C.: Library of Congress, 1979) pp. 16-21.

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